

FEATHER RIVER

TENTATIVE MAP WITH COMMON OPEN SPACE

Prepared by:



FEBRUARY 15, 2017

Job # 318-01

FEATHER RIVER

TENTATIVE MAP APPLICATION

Prepared for:

Agua Fria Insurance Services, LLC

3509 E. Harmon Avenue

Las Vegas, Nevada 89121

Prepared by:

Rubicon Design Group, LLC

100 California Avenue, Suite 202

Reno, Nevada 89509

(775) 425-4800

February 15, 2017



Table of Contents

Introduction	1
Project Location	1
Existing Conditions.....	2
Project History	6
Request Summary.....	6
Site Analysis	10
Truckee Canyon Area Plan.....	14
Potential Impacts.....	15
Traffic	15
Schools	16
Public Facilities/Infrastructure.....	17
Site Suitability	17
Public Services.....	17
Tentative Map Findings	18

List of Figures:

Figure 1 – Vicinity Map	1
Figure 2 – Existing Conditions.....	2
Figure 3 – Existing Conditions.....	3
Figure 4 – Master Plan Land Use	4
Figure 5 – Existing Zoning	5
Figure 6 – Preliminary Site Plan.....	7
Figure 7 –Truckee Canyon Area Plan Development Suitability Map	13



FEATHER RIVER

Appendices:

Washoe County Development Application
Owner Affidavit
Tentative Subdivision Map Application
Property Tax Verification
Washoe County Assessor's Office Map
Street Name Request Letter
Preliminary Title Report (Original Only)

Supplemental Information Package (6 Copies Attached):

Traffic Impact Analysis
Preliminary Geotechnical Investigation
Survey Computations
Preliminary Hydrology Report

Map Packages (6 Copies Attached):

Preliminary Engineering Plans
Preliminary Landscape Plan



FEATHER RIVER

Introduction

This application includes the following request:

- A **Tentative Map with Common Open Space** to create 325 single family lots on 116.59± acres located within the Truckee Canyon Area Plan.

Project Location

The Feather River site (APN's 084-291-38 and 084-332-03) consists of 116.59± acres located north of Interstate 80 and the Truckee River at the western terminus of Stampmill Road in Wadsworth. Figure 1 (below) depicts the project location.

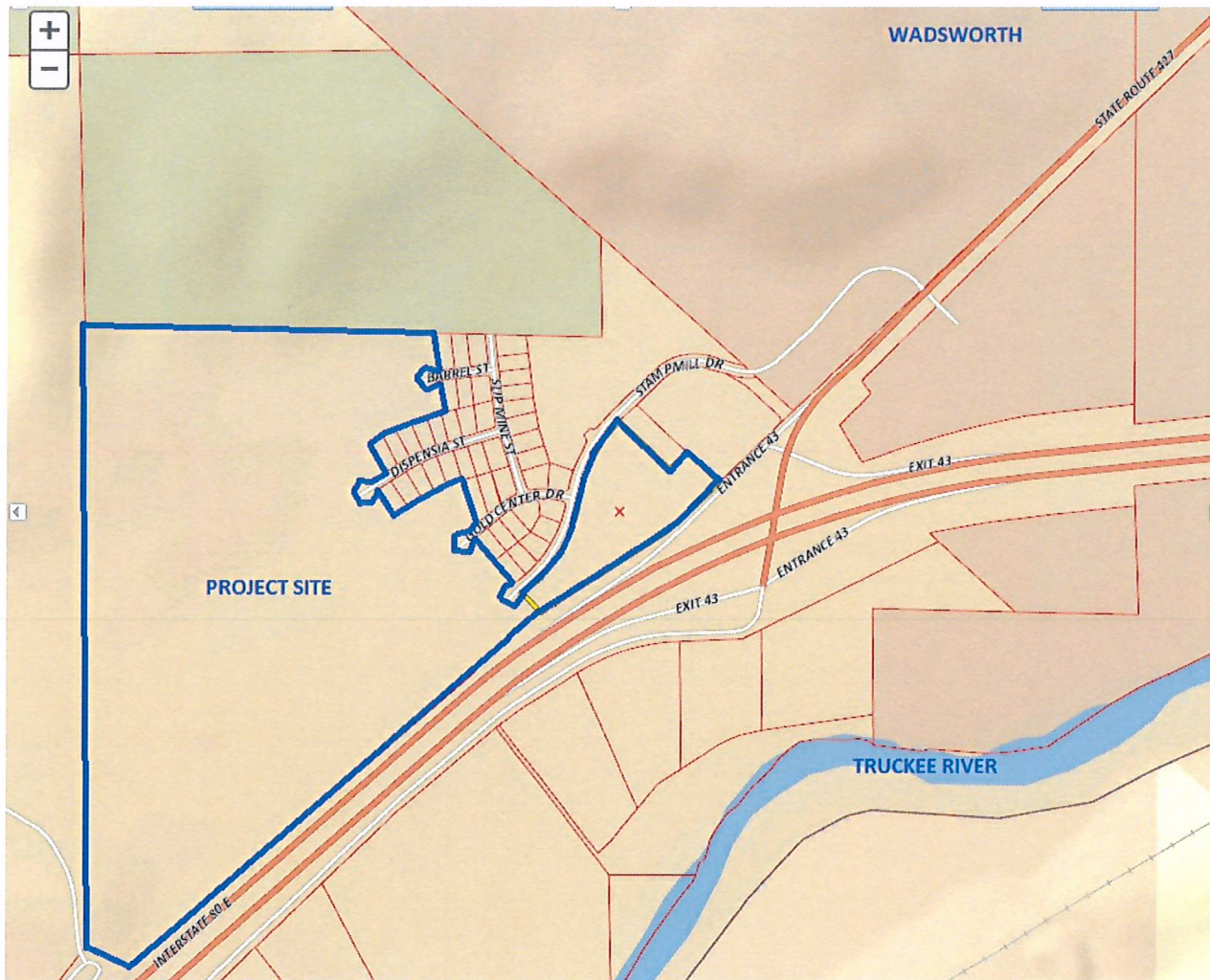


Figure 1 – Vicinity Map



FEATHER RIVER

Existing Conditions

Currently, the project site is vacant and represents the undeveloped portion of the previously approved Stampmill Estates project. Generally, the site is flat with slopes less than 5% and is framed by rolling terrain and ridgelines to the north and northwest.

Surrounding land use includes the developed portion of Stampmill Estates (single family residential) to the east, vacant land to the north and west, and Interstate 80 to the south. Figures 2 (below) and 3 (following page) depict the existing onsite conditions.



Figure 2 – Existing Conditions



FEATHER RIVER

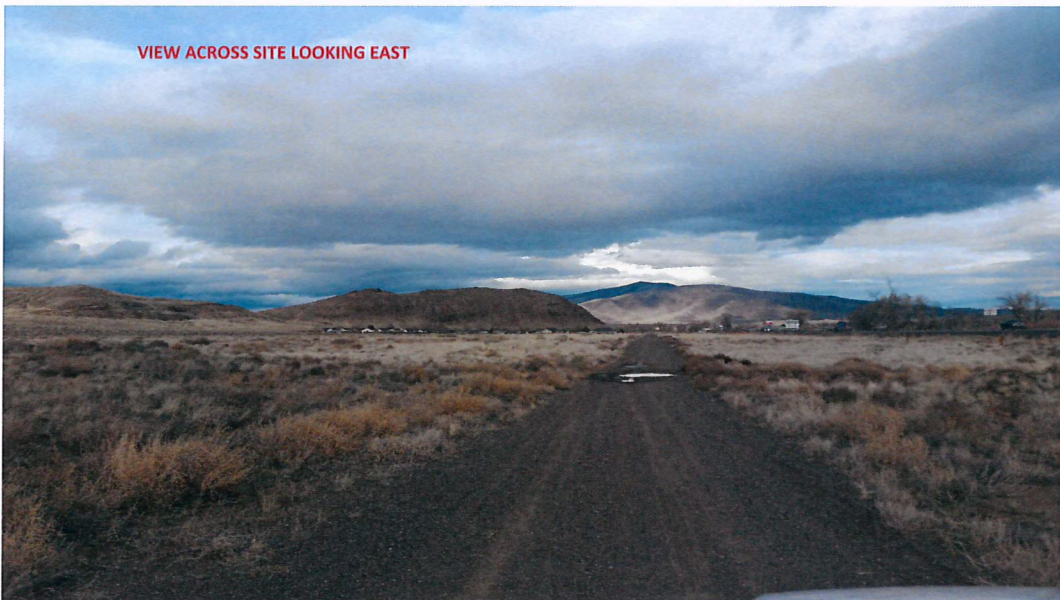
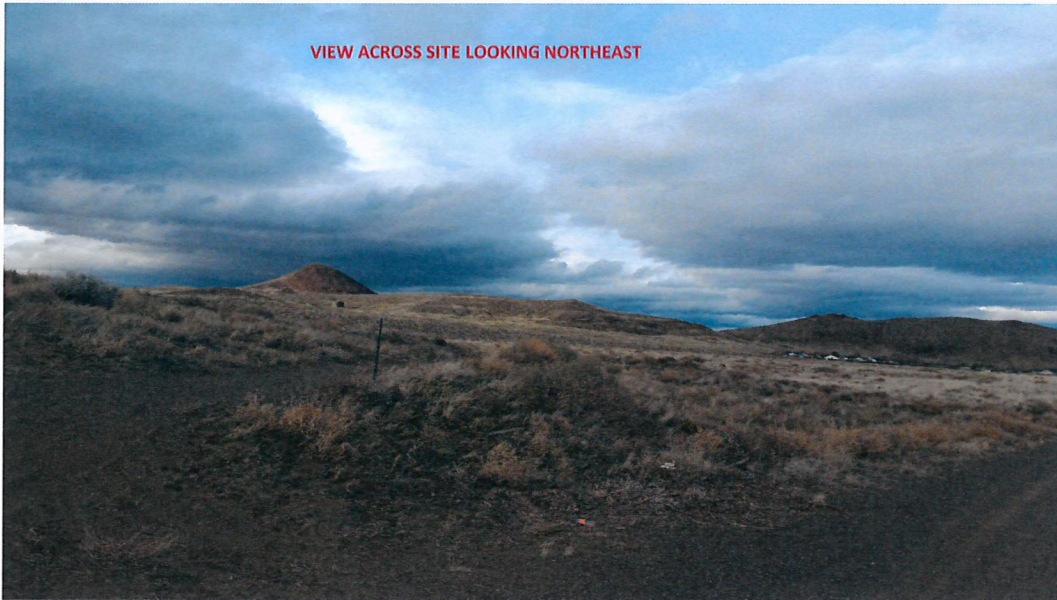
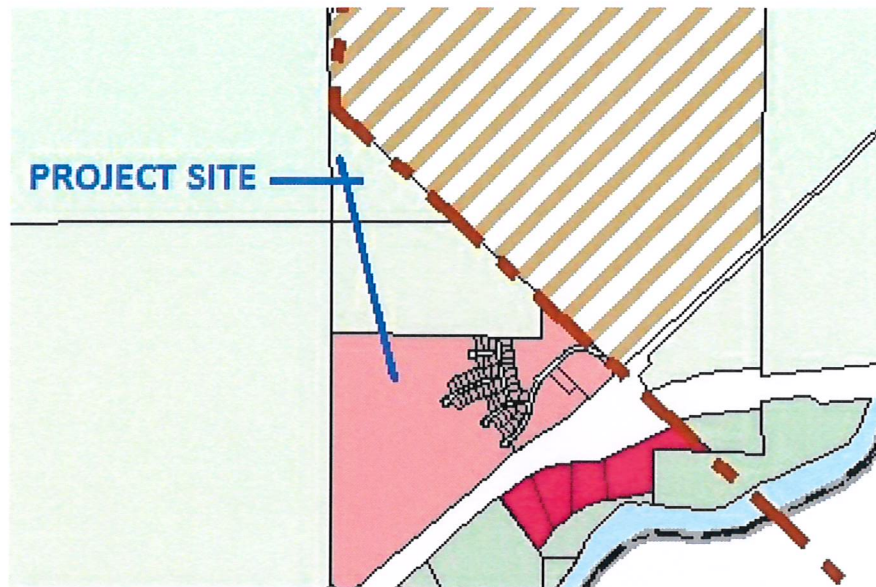


Figure 3 – Existing Conditions



FEATHER RIVER

The Feather River project site is designated as Suburban Residential in the Truckee Canyon Area Plan, an element of the Washoe County Master Plan. Consistent with the Suburban Residential designation, the site is zoned Medium Density Suburban (MDS). Figure 4 (below) depicts the existing Master Plan land use while Figure 5 (following page) depicts existing zoning patterns in the area.



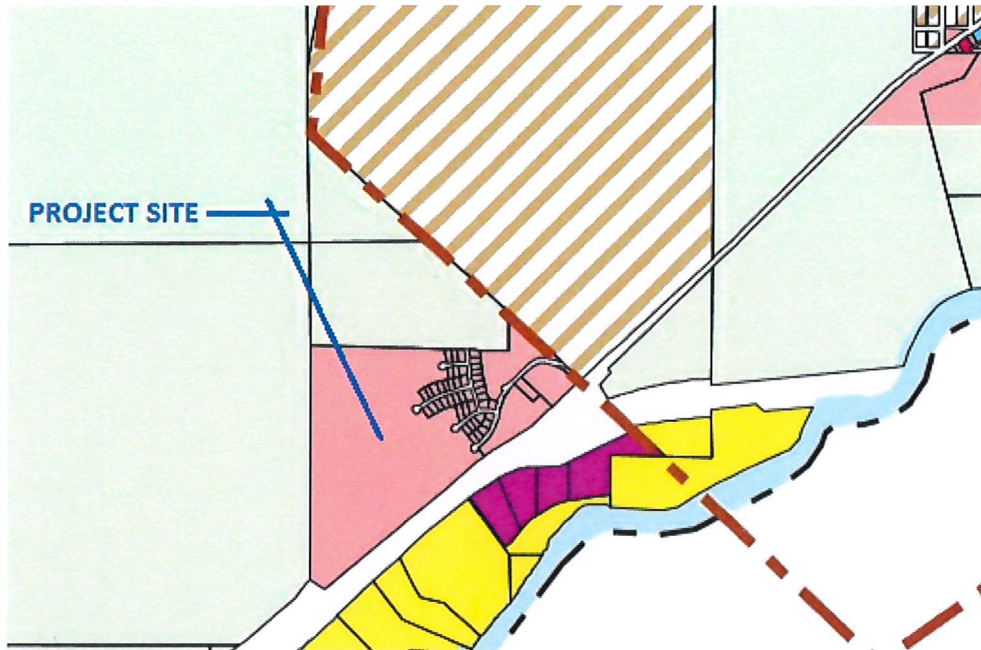
LEGEND

-  SUBURBAN RESIDENTIAL
-  RURAL
-  RURAL RESIDENTIAL
-  COMMERCIAL
-  TRIBAL LANDS

Figure 4 – Master Plan Land Use



FEATHER RIVER



LEGEND

-  MEDIUM DENSITY SUBURBAN
-  GENERAL RURAL
-  TOURIST COMMERCIAL
-  MEDIUM DENSITY RURAL
-  TRIBAL LANDS

Figure 5 – Existing Zoning



Project History

The Feather River project site has been planned for suburban type residential development for well over 15 years. In fact, the project site was once part of the Stampmill Estates project. Stampmill Estates was previously approved by Washoe County and would have permitted up to 349 homes (excluding those built within the first phases). The first phases of Stampmill Estates were constructed but the remaining phases were halted based on economic conditions and infrastructure improvement costs. As such the previous tentative map approval has subsequently expired.

The remaining portion of Stampmill Estates (now known as Feather River) is now under new ownership. Given significant changes that have occurred in the immediate area, including development of the Tahoe Reno Industrial Center (TRIC), there is a much stronger demand for new housing in the area. Therefore, this application will serve to implement the previously envisioned project although modifications have been made to the project plan in order to provide for efficiencies, better utilization of infrastructure, enhancement of proposed home sites, additional community amenities, etc.

Request Summary

As noted previously, this application includes a tentative Subdivision Map request to create 325 single family lots at the project site. It is planned to develop Feather River utilizing a Common Open Space Development approach, per the standards contained in Article 408 of the Washoe County Development Code.

The project will take access via a westerly extension of Stampmill Road. The previously approved Stampmill Estates project called for the extension of existing streets within the Stampmill Estates project. Given that these initial phases are now full established mature neighborhoods, a new design which locates Stampmill Road further south (away from existing residences) is proposed with only internal emergency access connections to the existing subdivision. This greatly reduces impacts of Feather River on existing homes and allows the existing neighborhood to retain its character. This will be further reinforced with the provision of a large open space buffer along the eastern boundary of the Feather River project.

Access in and out of Feather River will be from 3 new connections to the Stampmill Road extension. Additionally, Stampmill Road will be extended westward providing for future access to properties to the west as well as providing a connection under Interstate 80 to the south. These access points and roadway alignments will allow for efficient circulation in and out of Feather River, as well as efficient internal circulation. With close proximity to the existing interchange at Interstate 80, traffic generated by the project can be properly mitigated and will not result in significant impacts to the Wadsworth area. A detailed traffic impact analysis (prepared by Solaegui Engineers) is included as an attachment to this report.



FEATHER RIVER

Figure 6 (below) depicts the preliminary site plan developed for Feather River.

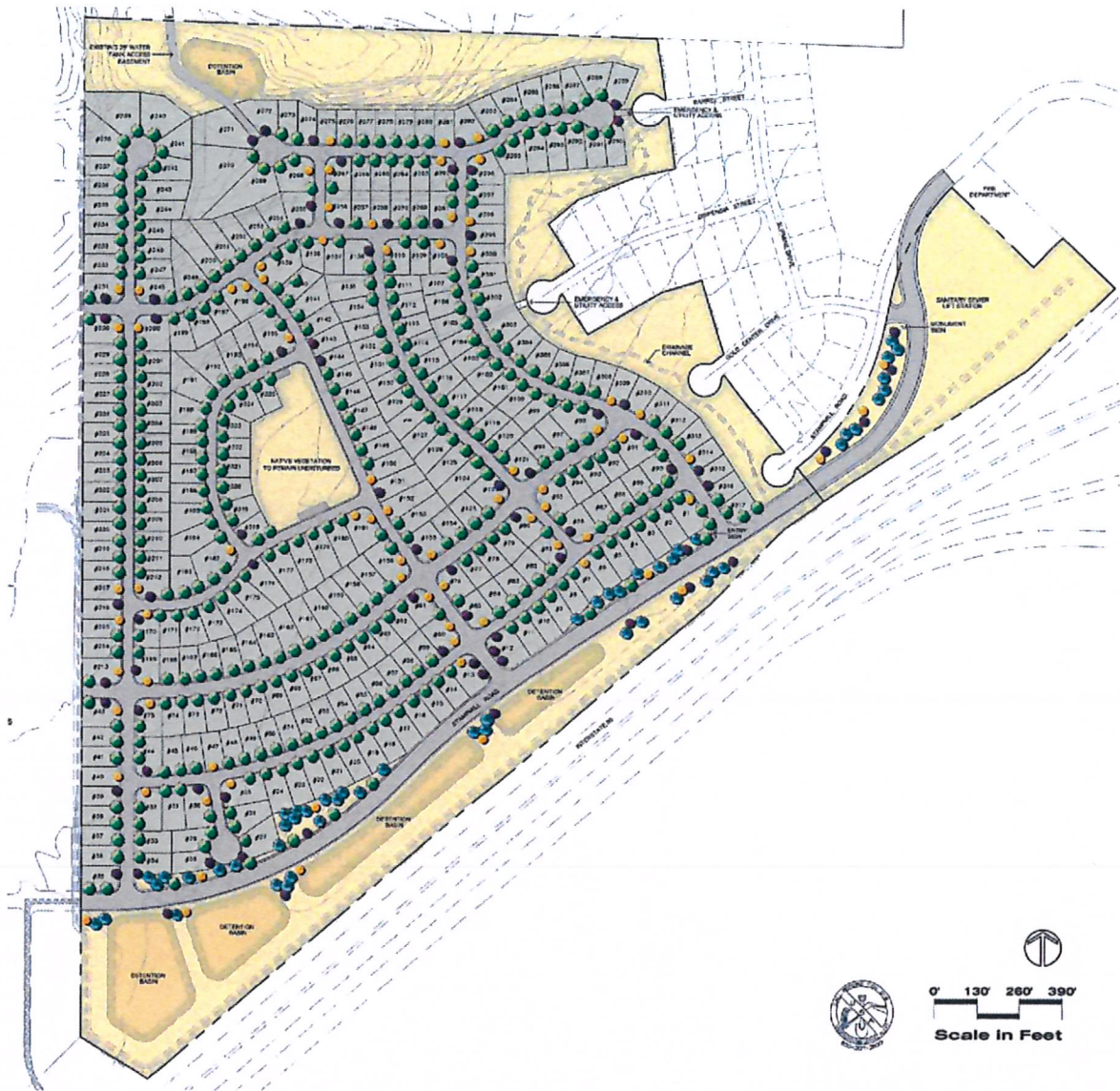


Figure 6 – Preliminary Site Plan



FEATHER RIVER

As depicted in Figure 6, the plan developed for Feather River includes 325 single family residential lots for an overall density of 2.79 units per acre. Included within the project are 38.35± acres of open space/common area. This includes a large internal acre open space area central to the site that will provide passive and active recreational opportunities for residents. It is envisioned that this area will serve much like a neighborhood park and can accommodate a wide range of recreational uses. Other open space areas include a significant buffer along the eastern edge of the project, providing separation of Feather River from Stampmill Estates. It is planned to provide for a pedestrian trail connection within this area in order to allow for connectivity between the two projects. Areas of steeper slope along the northern project perimeter have also been incorporated into open space. Lastly, an open space buffer will be located on the south side of Stampmill Road. This serves to provide area for onsite detention as well as a buffer between Feather River and Interstate 80, consistent with land use policies outlined in the Truckee Canyon Area Plan.

Open space/common areas within Feather River will include a mix of formal, informal and native landscape improvements. As previously depicted in Figure 6, formal plantings will occur at the project entry and along Stampmill Road and will provide a visually pleasing streetscape for those entering and existing the project. Additionally, trees will be planted in informal clusters at various locations in order to achieve a natural appearance over an “engineered” landscape treatment. The internal open space area will be revegetated with native plantings and is envisioned as an area that could be used for a dog park, etc. This area, along with all of the proposed open space/common areas will be maintained by a planned homeowners association (HOA). The HOA will determine future improvements to the internal open space based on resident input and reserves the right to develop formal recreational facilities (i.e. neighborhood park) should they desire.

As noted previously, the project site is currently designated Suburban Residential in the Truckee Canyon Area Plan and is zoned Medium Density Suburban (MDS). No changes to the existing land use designations are proposed as part of this request. Lot sizes within Feather River are consistent with the existing MDS zoning and are complementary to the Stampmill Estates subdivision to the east. Lots within Feather River range in size from 6,000± square feet to 25,740± square feet with an overall average lot size of 7,720± square feet. The overall density of 2.79 units per acre is below the allowable density of 3 units per acre and the clustering of units within Feather River allows for 33% of the project site to be retained as open space, including buffer areas, protected hillside areas, detention facilities, etc.

The initial phases of Stampmill Estates (already constructed) were built utilizing individual septic systems. Current Washoe County Health Department regulations preclude individual septic systems on lots smaller than 2.5 acres. As a result, all new lots within Feather River will include sanitary sewer service. This will be accomplished with the construction of a new waste water treatment facility that will serve the Feather River project. Details of this facility will be developed concurrently with the tentative map review and will be coordinated with Washoe County Engineering, the District Health Department and State of Nevada. Initially, it is envisioned that the treatment facility will be located to the west of the Feather River site, away from existing and planned residences. Properties to the west are under common ownership with Feather River. The plant would also provide the opportunity for future connections and can provide treated effluent for us in irrigating common areas, etc.



FEATHER RIVER

The Truckee Meadows Water Authority (TMWA) operates the existing water system that serves Stampmill Estates and areas of Wadsworth. Feather River will connect with TMWA facilities and will be required to dedicate necessary water rights to serve new homes within the project. This along with the sanitary sewer improvements will be included as conditions on this tentative map request.

Roadways within Feather River will be constructed to Washoe County standards and will be dedicated as public rights-of-way. Phasing for the project will largely be dependent on current market conditions. It is envisioned that there will be no more than 8 phases for the project. Final maps may be recorded separately or concurrently for each phase and bonding for improvements shall occur in accordance with Washoe County requirements and policies. It is anticipated that the first phase will be located at the southeastern portion of the project site with construction moving to the north and west until buildout is complete.

Home plans for Feather River are still being developed and are envisioned to complement surrounding development. Larger lots included within Feather River are conducive to larger single story floor plans although no limitation on two-story models is proposed. Consistent with Washoe County policy, final home plans and elevations will be subject to the review and approval of the Washoe County Design Review Committee for compliance with development code and Area Plan standards.

Fencing for the project will include six-foot wood fences for side and rear yards. Lots adjoining open space areas will include a 4-foot open fence such as split rail or wrought iron. These fencing requirements will also be included in the CC&R's recorded for Feather River.

The following table provides an overall summary of the Feather River project:

Development Standard	Proposed with Feather River
Total Project Area	116.59± acres
Total Lot Area	57.60± acres
Right-of-Way Area	20.64± acres
Common Area	38.35± acres
Project Density	2.79 dwelling units per acre
Minimum Lot Size	6,000± square feet
Maximum Lot Size	25,740± square feet
Average Lot Size	7,720± square feet



Site Analysis

Article 408 of the Washoe County Development Code establishes regulations related to Common Open Space Developments (COSD). Specifically, Section 110.408.30 requires a site analysis be conducted. This site analysis criteria is listed below and addressed in **bold face** type.

Section 110.408.30 Site Analysis to Determine Common Open Space and Lot Size Variations. A site analysis showing development opportunities and constraints shall be prepared as a key consideration, along with the project design objectives, to determine the total area covered by lots and roads, lot areas, and the total area to be designated as common open space. The site analysis shall include information and maps, including a site opportunities and constraints map, describing all significant physical and contextual features or factors which may affect the development of the property. The elements of the site analysis shall include, as a minimum, the following information:

- (a) Location Map. A general location map providing the context of location and vicinity of the site.

Figure 1 (page 1) included in this report provides an overall location/vicinity map for Feather River. Additionally, a vicinity map is also included on the Tentative Map Title Sheet in the accompanying map pocket.

- (b) Land Use. Current and planned land use on the site and adjacent current, planned and approved, but unbuilt land uses.

The project, as presented, fully conforms with the existing Suburban Residential Master Plan designation and MDS zoning. In fact, at 2.79 dwelling units per acre, Feather River is under the allowable density of 3 units per acre. As depicted in Figures 5 and 6, the MDS zoning of the site is consistent with parcels to the west, including the Stampmill Estates subdivision.

- (c) Existing Structures. A description of the location, physical characteristics, condition and proposed use of any existing structures.

Not applicable. There are no existing onsite structures.

- (d) Existing Vegetation. A description of existing vegetation, including limits of coverage, and major tree sizes and types. In the instance of heavily wooded sites, typical tree sizes, types and limits of tree coverage may be substituted.

The Feather River site is characterized by natural vegetation consisting mostly of sagebrush, rabbit brush, and patches of cheat grass. There are no existing trees on the property.



FEATHER RIVER

- (e) Prevailing Winds. An analysis of prevailing winds.

Prevailing winds in the area are from west to east with occasional northerly winds during storm events. The proposed project layout should not be negatively impacted by the prevailing winds in the area.

- (f) Topography. An analysis of slopes on the site using contour interval of five (5) feet, or at a contour interval appropriate for the site and agreed to by the Director of Community Development.

The project site is generally flat with the exception of steeper rolling terrain on the north. The project does not qualify as a hillside development and steeper areas along the northern boundary are preserved as open space with the proposed project plan. The engineering plans included with this application provide for grading and drainage plans that clearly depict the site topography.

- (g) Soil. An analysis of the soil characteristics of the site using Soil Conservation Service (SCS) information.

A preliminary geotechnical report is included as an attachment to this report and identifies no soil or geologic conditions that would preclude residential development at the densities proposed.

- (h) Natural Drainageways. Identification of natural drainageways on and adjacent to the site.

Natural drainage that occurs across the site will be retained and is incorporated into the provided open space. A detailed hydrology study is also included as an attachment to this report.

- (i) Wetlands and Water Bodies. Identification of existing or potential wetlands and water bodies on the site.

Not applicable. No wetlands or water bodies exist onsite.

- (j) Flood Hazards. Identification of existing and potential flood hazards using Federal Emergency Management Agency (FEMA) information.

Based on FEMA mapping, none of the Feather River project area is located within an identified flood hazard zone.

- (k) Seismic Hazards. Identification of seismic hazards on or near the site, including location of Holocene faults.

A preliminary geotechnical report is included with this application and identifies no known seismic hazards.

- (l) Avalanche Hazards. An analysis of avalanche and other landslide hazards.

Not applicable.



FEATHER RIVER

(m) Sensitive Habitat and Migration Routes. An analysis of sensitive habitat areas and migration routes.

Not applicable. There are no known or identified sensitive habitats or significant migration routes onsite. Additionally, open space corridors proposed within the project will allow for wildlife to traverse the project site.

(n) Significant Views. A description and analysis of all on and off site significant views.

As a relatively flat site, views are generally to offsite ridgelines to the north and south.

(o) Easements. A description of the type and location of any easements on the site.

All existing and proposed easements are clearly depicted on the engineering plans included with this report. Additionally, a preliminary title report is being submitted with the original report that identifies and describes all existing easements.

(p) Utilities. A description of existing or available utilities, and an analysis of appropriate locations for water, power, sanitary sewer and storm water sewer services.

The attached engineering plans and drawings depict all existing utilities/infrastructure and proposed extensions, etc. The project will connect to all municipal services including sewer, water, natural gas, cable television, etc. Through this tentative map process, the project engineers will work with Washoe County and the State of Nevada to determine requirements for and location of a wastewater treatment facility.

(q) Appropriate Access Points. An analysis of appropriate access points based upon existing and proposed streets and highways and site opportunities and constraints.

The extension of Stampmill Road provides logical, convenient and efficient access to Interstate 80 from Feather River. Additionally, it is proposed to realign Stampmill Road further south at the eastern edge of the project, moving the roadway farther from existing homes on the south side of Stampmill Estates. A detailed traffic impact analysis, prepared by Solaegui Engineers, is also included as an attachment to this report.

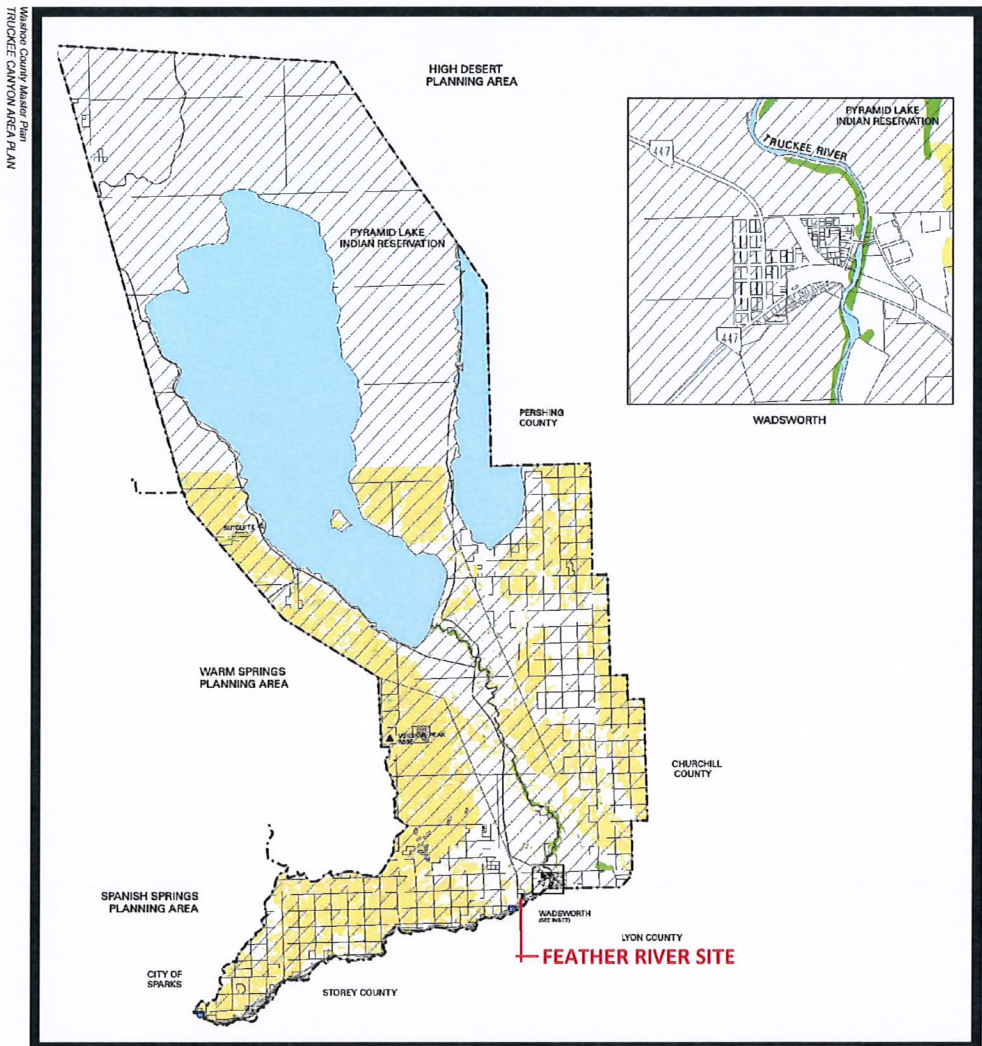
(r) Other Information. All other information deemed appropriate and necessary by the Director of Community Development.

This report provides for all pertinent and required details. Additional information and analysis can be provided on an as-needed basis as it may arise during the public review process.

As part of the Site Analysis required under the COSD standards, the Development Suitability Map from the Truckee Canyon Area Plan was referenced and indicates that the Feather River site is "most suitable for development." Figure 7 (following page) includes the Development Suitability Map taken from the Truckee Canyon Area Plan.



FEATHER RIVER



Washoe County Master Plan
TRUCKEE CANYON AREA PLAN

TRUCKEE CANYON DEVELOPMENT SUITABILITY

<ul style="list-style-type: none"> RIDGE LINES TO BE PROTECTED SLOPES GREATER THAN 15% FLOODWAY AREA 100-YEAR FLOOD HAZARD POTENTIAL WETLANDS 	<ul style="list-style-type: none"> BOTH POTENTIAL FLOOD HAZARD AND POTENTIAL WETLANDS PUBLIC LAND MOST SUITABLE WATER BODIES
--	---

g:\arcinfo\planarea\fc\tcd\00.gri

DATE: MAY 2006

NOTE: THE SCALE AND CONTRIBUTION OF ALL INFORMATION SHOWN HEREIN ARE APPROXIMATE ONLY AND ARE NOT TO BE USED AS A BASIS FOR DESIGN OR ANY OTHER PROFESSIONAL WORK. REPRODUCTION IS NOT PERMITTED WITHOUT WRITTEN PERMISSION FROM THE WASHOE COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT.

0 2.5 5
SCALE IN MILES

↑

**Department of
Community
Development**

**WASHOE COUNTY
NEVADA**

POST OFFICE BOX 11130
RENO, NEVADA 89320
(775) 325-0500

September 27, 2012
Page 11

Figure 7 – Truckee Canyon Area Plan Development Suitability Map

13



FEATHER RIVER

Truckee Canyon Area Plan

As previously noted, the Feather River site is located within the Truckee Canyon Area Plan, an element of the Washoe County Master Plan. The Area Plan designates the site as Suburban Residential which is consistent with the project being proposed. Also included within the plan are a variety of policies and action programs adopted by Washoe County for implementation within the plan area boundaries. While a number of these policies and action programs are not applicable to Feather River, those that are relevant are listed below and are addressed in **bold face** type.

TC.1.1 Ensure that the scenic views of the Truckee Canyon planning area remain unobstructed.

TC.1.1.1 A minimum 25-foot buffer should be provided between all property lines and rights-of-way along all arterial streets. No fences, walls or structures shall be permitted in these areas. At the time of subdivision review, a landscape theme should be evaluated.

Stampmill Road will be developed with a landscaped buffer along the south side that not only serves to implement this policy but will create an attractive streetscape. As proposed, new development within Feather River will not block views to surrounding ridgelines/natural features. In fact, steeper areas of the Feather River site will be preserved as open space.

TC.1.3 Preserve and enhance the visual qualities of the Truckee Canyon planning area as viewed from Interstate 80.

TC.1.3.1 Proposed developments shall be reviewed to ensure the view from Interstate 80 is preserved. Height limitations and setbacks will help preserve the visually predominant ridges and escarpments.

TC.1.3.2 The Washoe County Department of Community Services shall investigate creating scenic corridor guidelines in the proposed Development Code. These should apply to the segment of Interstate 80 within the planning area.

Feather River proposes single family development with a maximum of 2-stories (per Development Code standards). As such, views from Interstate 80 to the surrounding ridgelines will be preserved. Additionally, new landscape improvements will provide for an aesthetically pleasing appearance from both I-80 as well as Stampmill Road.

TC.2.1 Require on-site pump tests be performed before final map recordation to demonstrate adequate water supply is available for all proposed subdivisions.

Feather River will connect with the existing TMWA water system. This will require dedication of water rights to serve new units and the Feather River developer will be responsible for any required improvements. All necessary analysis and studies will be completed prior to final map and can be conditioned with this tentative map request.



FEATHER RIVER

TC.3.3 Ensure screening and buffering is placed between residential developments and incompatible land uses.

Although Feather River is directly compatible with the adjoining Stampmill Estates project, a large open space buffer is provided at the east side of the project. This will allow Stampmill Estates to retain its own sense of identity as well as protect the privacy of existing residences.

TC.3.4 Prevent future residential subdivisions from locating residences next to either Interstate 80 or the Southern Pacific Railroad. Effective shielding and buffering will be planned to provide noise abatement.

TC.3.4.1 Tentative maps shall not locate residences closer than 500 feet line-of-site exposure or 100 feet shielded exposure to the right-of-way of major highways and railroads. Outside noise levels at the residence shall not exceed a maximum of 65 db when trains are passing or 65 Ldn next to Interstate 80.

As noted previously, homes within Feather River are setback significantly from I-80 and are buffered by a large open space buffer along the highway. Intervening fencing and landscaping along with Stampmill Road will serve as effective buffer between new homes and the Interstate. Additionally, based on the overall lotting plan, residences will be well over the 500-foot line of site exposure noted in TC.3.4.1.

Potential Impacts

This section aims to provide a cursory impact analysis based on the conceptual plan developed for the project, as presented in Figure 6.

- **Traffic**

Traffic is a measurable impact that will result no matter what is developed at the site. As part of this application and consistent with the Washoe County Master Plan and Development Code, a comprehensive traffic impact study, prepared by Solaegui Engineers is attached within the appendices of this report.

The traffic analysis addresses Feather River's impact upon the adjacent street network. Specifically, the State Route 427 intersections with Stampmill Road and Interstate 80 eastbound and westbound ramps were identified for AM and PM peak hour capacity analysis for the existing, existing plus project, 2027 base and 2027 base plus project scenarios.



FEATHER RIVER

The project is expected to generate 3,094 average daily trips (ADT) with 244 trips occurring during the AM peak hour and 325 trips occurring during the PM peak hour. As further detailed in the attached Solaegui report, the following traffic impact mitigations are recommended for the project:

- It is recommended that any required signing, striping or traffic control improvements comply with Washoe County and Nevada Department of Transportation requirements.
- It is recommended that the northbound left turn lane at the State Route 427/Stampmill Road intersection be improved to include a minimum of 325 feet of storage/deceleration length.
- It is recommended that the project roadways, cul-de-sacs and intersections be designed to conform to Washoe County street standards.

These improvements will serve to ensure that all traffic impacts are properly mitigated and that proper levels of service are maintained for area roadways.

- **Schools**

As part of this Tentative Map process, the Washoe County School District was consulted as to the current capacities of schools that serve the project area. It was determined that the project site is zoned for the following schools:

- Natchez Elementary School
- Mendive Middle School
- Reed High School

Mike Boster, Washoe County School District Planner, provided the School District's accepted student generation formulas along with the 2016/2017 enrollments and capacities for each school. Mr. Boster also indicated that capacities can be misleading based on special programs that may be occurring within the school facility. For example, elementary schools often have special education classes, gifted and talented programs, autism specialty programs, etc. which are capped by law on maximum classroom size. This can therefore skew actual capacity levels. Regardless, Mr. Boster concurred that the School District could provide refined enrollment and capacity numbers as part of this and a future public review process.

Once again, for the sake of this analysis, a density yield of 161 units was assumed. The following table summarizes potential school impacts.

School	Current Enrollment ¹	Capacity ¹	Generation Rate ¹	Number of New Students
Natchez ES	161 students	305 students	0.155/unit	50 students
Mendive MS	1,053 students	1,072 students	0.033/unit	11 students
Reed HS	2,059 students	2,127 students	0.041/unit	13 students

¹ – provided by the Washoe County School District.



FEATHER RIVER

It is important to note that this analysis does not consider the potential for children to attend charter schools, private institutions, or home schooling and is therefore a worst-case scenario in terms of student generation projections.

- **Public Facilities/Infrastructure**

All municipal services (i.e. water, sewer, storm drain, etc.) will be provided for Feather River. In some instances, services are in place or will be extended (at the developer's expense) to serve the project. Consistent with the policies of the Truckee Canyon Area Plan and requirements of the Washoe County Development Code, all new lots within Feather River will be served by municipal water and sewer. Power, natural gas, cable television, and high speed internet service all exist at or adjacent to the project site.

As discussed previously, a new waste water treatment facility must be developed in conjunction with Feather River in order to serve the project. The project developer will work with Washoe County and the State of Nevada during the tentative map process in order to determine required design parameters, location, etc.. By providing the new treatment facility, all standards and requirements of Washoe County will be implemented and no new septic systems will occur.

Another noteworthy point is that the proposed clustering of units (through a common open space subdivision) will result in resource conservation, reduction in water use, etc. All of the applicable infrastructure is analyzed with the preliminary engineering plans and reports included with this report and compliance is demonstrated.

Preliminary utility plans are included with the engineering plans located in the accompanying map pocket of this report.

- **Site Suitability**

As noted previously in this report, the site is well suited for the type of density potential associated with the requested designations. This is based on the fact that the site is flat and the availability of existing site services and infrastructure and the fact that the proposed project is consistent with the existing land use designations for the site. Furthermore, the site is not encumbered by geologic, cultural, historical, or flood concerns that would preclude development. For reference, a feasibility geotechnical investigation is included in the appendices of this report.

- **Public Services**

The property is within an acceptable response time of the Truckee Meadows Fire Protection District station located just east of the project boundary. Also, the Washoe County Sherriff's Office has existing patrols within the project area.



Tentative Map Findings

Section 110.608.20 of the Washoe County Development Code establishes legal findings that must be made by the Planning Commission or Board of County Commissioners in order to approve a Tentative Map request. These findings are listed below and are addressed in **bold face** type.

- (a) Environmental and Health Laws. Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal;

Feather River will be served by municipal water and sewer service, ensuring full compliance with this finding. As part of this tentative map review, the applicant will work closely with Washoe County and the State of Nevada to determine details and conditions related to the construction of a new waste water treatment facility to serve the project. Additionally, solid waste disposal service will be provided through Waste Management which currently operates routes in Wadsworth and the surrounding areas.

- (b) Availability of Water. The availability of water which meets applicable health standards as well as requirements for water rights, quality or will-serve commitments;

The project site is within the service boundary of the Truckee Meadows Water Authority and is currently in the Discovery process through TMWA. Water rights will be dedicated to TMWA to serve the project, ensuring full compliance with this finding. Water rights can be purchased directly from TMWA or on the open market (with full TMWA acceptance).

- (c) Utilities. The availability and accessibility of utilities;

The project will be served by all municipal utilities, infrastructure, and services as detailed within this report and on the attached engineering plans.

- (d) Public Services. The availability and accessibility of public services such as schools, police and fire protection, transportation, recreation and parks;

The project is within an acceptable response time of the Truckee Meadows Fire Protection District's station in Wadsworth and is in an area of existing Sherriff patrols. Schools that will serve the project along with their current enrollments are detailed within this report. It is further recognized that it will be disclosed to all new residents (at time of purchase) that school zoning is subject to change based on current enrollments, capacities, etc.

(e) Plan Consistency. General conformance with the Development Code and Master Plan;
Feather River is in direct conformance with the Suburban Residential Master Plan designation and Medium Density Suburban zoning.



FEATHER RIVER

- (f) Impact on Existing Streets. The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision;

A detailed traffic impact analysis is included with this application and identifies improvements needed to mitigate traffic impacts created by Feather River. These improvements can be conditioned with the Tentative Map and must be completed prior to the issuance of certificates of occupancy for new homes. This will ensure full compliance with this finding.

- (g) Physical Characteristics. Physical characteristics of the land such as flood plain, slope and soil;

The site is well suited for the type and intensity of development proposed. The site contains no slope or soil conditions that would preclude development nor does it contain any significant wildlife habitats, etc. Steeper areas to the north will remain undisturbed and will be incorporated into the planned open space.

- (h) Agency Review. The recommendations and comments of the entities reviewing the tentative map; and

Copies of this report and the included plans will be circulated to all applicable reviewing agencies for review and comment. Specific requirements and relevant comments can be included as conditions tied to this request and implemented with final map(s).

- (i) Impact on Existing Drainage System. The effect of the proposed subdivision on the existing natural and man-made drainage system.

The project will provide for onsite detention to ensure that no additional flows over what currently exist will occur from the site with development of Feather River. A highly-detailed hydrology study is also included in the appendices of this report demonstrating compliance with all applicable Washoe County requirements related to drainage.

Washoe County Development Application

Your entire application is a public record. If you have a concern about releasing personal information, please contact Planning and Development staff at 775.328.3600.

Project Information		Staff Assigned Case No.: _____	
Project Name: Feather River			
Project Description: A request for a tentative subdivision map with common open space in order to develop 325 single family lots			
Project Address: Western terminus of Stampmill Road, north of I-80, Wadsworth			
Project Area (acres or square feet): 116.59 acres			
Project Location (with point of reference to major cross streets AND area locator): The site is located in Wadsworth at the western terminus of Stampmill Road, west of State Route 427, north of Interstate 80.			
Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
084-291-38	108.41		
084-332-03	8.176		
Section(s)/Township/Range:			
Indicate any previous Washoe County approvals associated with this application: Case No.(s).			
Applicant Information (attach additional sheets if necessary)			
Property Owner:		Professional Consultant:	
Name: Agua Fria Insurance Services, LLC		Name: Rubicon Design Group, LLC	
Address: 3509 E. Harmon Ave., Las Vegas, NV Zip: 89121		Address: 100 California Ave. Suite 202, Reno, NV Zip: 89509	
Phone: 702-547-2273 Fax:		Phone: 775-425-4800 Fax:	
Email: nnsharda@yahoo.com		Email: mrailey@rubicondesigngroup.com	
Cell: Same as Above Other:		Cell: 775-250-3455 Other:	
Contact Person:		Contact Person: Mike Railey	
Applicant/Developer:		Other Persons to be Contacted:	
Name: Same as Above		Name: TEC Engineering Consultants	
Address:		Address: 9437 Double Diamond Pkwy., # 17, Reno, NV	
Zip:		Zip: 89521	
Phone: Fax:		Phone: 775-352-7800 Fax: 352-7929	
Email:		Email: jgilles@tecreno.com	
Cell: Other:		Cell: 775-846-0164 Other:	
Contact Person:		Contact Person: Jason Gilles	
For Office Use Only			
Date Received: Initial:		Planning Area:	
County Commission District:		Master Plan Designation(s):	
CAB(s):		Regulatory Zoning(s):	

Property Owner Affidavit

Applicant Name: Agua Fria Insurance Services, LLC

The receipt of this application at the time of submittal does not guarantee the application complies with all requirements of the Washoe County Development Code, the Washoe County Master Plan or the applicable area plan, the applicable regulatory zoning, or that the application is deemed complete and will be processed.

STATE OF NEVADA)
COUNTY OF WASHOE)

I, NAVNEET N. SHARDA
(please print name)

being duly sworn, depose and say that I am the owner* of the property or properties involved in this application as listed below and that the foregoing statements and answers herein contained and the information herewith submitted are in all respects complete, true, and correct to the best of my knowledge and belief. I understand that no assurance or guarantee can be given by members of Planning and Development.

(A separate Affidavit must be provided by each property owner named in the title report.)

Assessor Parcel Number(s): 084-291-38, 084-332-03

Printed Name NAV SHARDA

Signed [Signature]

Address 3509 E. HARMON AVE
LAS VEGAS NV 89121

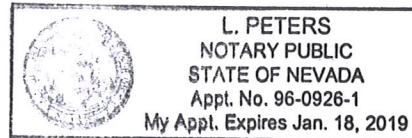
Subscribed and sworn to before me this 15 day of Feb, 2011

[Signature]

Notary Public in and for said county and state

My commission expires: 11/18/19

(Notary Stamp)



*Owner refers to the following: (Please mark appropriate box.)

- Owner
- Corporate Officer/Partner (Provide copy of record document indicating authority to sign.)
- Power of Attorney (Provide copy of Power of Attorney.)
- Owner Agent (Provide notarized letter from property owner giving legal authority to agent.)
- Property Agent (Provide copy of record document indicating authority to sign.)
- Letter from Government Agency with Stewardship


OWNERSHIP DOCUMENTATION


Search Date and Time:
2/15/2017 10:43:45 AM


File Number:
L11893633


Corporation Name:
AGUA FRIA INSURANCE SERVICES, LLC


[Collapse](#) | [Expand](#)

Corporate Inquiry 		
File Number	Corporation Name	Check Corporate Status
L11893633	AGUA FRIA INSURANCE SERVICES, LLC	<input type="button" value="Check Corporate Status"/>

Domestic Address 
1410 W GUADALUPE RD STE 121 GILBERT, AZ 85233

Statutory Agent Information 
Agent Name: AVERY MANAGEMENT & CONSULTING
Agent Mailing/Physical Address: 1410 W GUADALUPE RD STE 121 GILBERT, AZ 85233
Agent Status: APPOINTED 12/22/2010
Agent Last Updated: 10/29/2014

Additional Entity Information 	
Entity Type: DOMESTIC L.L.C.	Business Type:
Incorporation Date: 3/18/2005	Corporation Life Period: PERPETUAL




Domicile: ARIZONA

County: MARICOPA

Approval Date: 3/18/2005


Original Publish Date: 5/31/2005

Manager/Member Information 

Name	Title	Address	Date of Taking Office	Last Updated
NAVNEET N SHARDA	MANAGER	3509 E HARMON AVE LAS VEGAS, NV 89121	03/09/2015	03/13/2015
RICHARD F AVERY	MANAGER	3758 E COVINA ST MESA, AZ 85205	02/22/2012	03/13/2015
FIRST TRUST PROP & CASUALTY	MEMBER	1410 W GUADALUPE RD STE 121 GILBERT, AZ 85233	02/22/2012	10/29/2014

Scanned Documents 


Click on a gold button below to view a document. If the button is gray, the document is not yet available. Please check back again later.

Document Number	Description	Date Received
04971247 (http://corporations.images.azcc.gov/04971247.pdf)	AMENDMENT	3/9/2015
04839509 (http://corporations.images.azcc.gov/04839509.pdf)	CHANGE(S)	9/30/2014
04839510 (http://corporations.images.azcc.gov/04839510.pdf)	MEMBER/MANAGER ADDRESS CHANGE	9/30/2014
03887297 (http://corporations.images.azcc.gov/03887297.pdf)	PUB OF AMENDED ARTICLES OF ORGANIZATION	5/3/2012
03769799 (http://corporations.images.azcc.gov/03769799.pdf)	AMENDMENT	2/22/2012
03364780 (http://corporations.images.azcc.gov/03364780.pdf)	CHANGE(S)	12/22/2010
01230800 (http://corporations.images.azcc.gov/01230800.pdf)	PUB OF ARTICLES OF ORGANIZATION	5/31/2005
01213761 (http://corporations.images.azcc.gov/01213761.pdf)	AGENT APPOINTMENT/CORP ADDR CHG	5/13/2005 

Document Number	Description	Date Received
01159299 (http://corporations.images.azcc.gov/01159299.pdf)	ARTICLES OF ORGANIZATION	3/18/2005

Microfilm 

Location	Entered	Description
31858002723	3/18/2005	ARTICLES OF ORGANIZATION
31865003039	5/13/2005	AGENT APPOINTMENT/CORP ADDR CHG
31871001888	5/31/2005	PUB OF ARTICLES OF ORGANIZATION
32249030017	12/22/2010	CHANGE(S)
32321032040	2/22/2012	AMENDMENT
32328080016	5/3/2012	PUB OF AMENDED ARTICLES OF ORGANIZATION

Amendments 

Amendment Date	Amendment Type	Publish Date	Publish Exception
3/9/2015	AMENDMENT		WAIVE
2/22/2012	NAME CHANGE	5/3/2012	

Name Changes/Restructuring 

Description	Corporation Name	Date
CHANGED FROM	AGUA FRIA DEVELOPMENT, LLC (/Details/corp?corpId=L11893633)	2/22/2012

Print Details



Community Services Department
Planning and Development
TENTATIVE SUBDIVISION MAP
APPLICATION



Community Services Department
Planning and Development
1001 E. Ninth St., Bldg. A
Reno, NV 89520

Telephone: 775.328.3600

Tentative Subdivision Map Application Supplemental Information

(All required information may be separately attached)

Chapter 110 of the Washoe County Code is commonly known as the Development Code. Specific references to tentative subdivision maps may be found in Article 608, Tentative Subdivision Maps.

1. What is the location (address or distance and direction from nearest intersection)?

The project site is located at the western terminus of Stampmill Road, north of Interstate 80, west of State Route 427 in Wadsworth. Refer to attached vicinity map.

2. What is the subdivision name (proposed name must not duplicate the name of any existing subdivision)?

Feather River

3. Density and lot design:

a. Acreage of project site	116.59 acres
b. Total number of lots	325
c. Dwelling units per acre	2.79 du/ac
d. Minimum and maximum area of proposed lots	6,000 sq.ft. minimum/25,740 sq.ft. maximum
e. Minimum width of proposed lots	60 feet
f. Average lot size	7,720 square feet

4. Utilities:

a. Sewer Service	To be provided with new waste water treatment facility
b. Electrical Service	NV Energy
c. Telephone Service	Charter and/or AT&T
d. LPG or Natural Gas Service	NV Energy
e. Solid Waste Disposal Service	Waste Management
f. Cable Television Service	Charter and/or AT&T
g. Water Service	Truckee Meadows Water Authority

5. For common open space subdivisions (Article 408), please answer the following:

a. Acreage of common open space:

38.35 acres

b. Development constraints within common open space (slope, wetlands, faults, springs, ridgelines):

Common open space proposed protects steeper slopes on the site as well as provides buffers between existing homes and new development. Refer to attached report for a detailed description.

c. Range of lot sizes (include minimum and maximum lot size):

6,000 square feet to 25,740 square feet

d. Average lot size:

7,720 square feet

e. Proposed yard setbacks if different from standard:

Standard setbacks will be implemented.

f. Justification for setback reduction or increase, if requested:

N/A

g. Identify all proposed non-residential uses:

N/A

- h. Improvements proposed for the common open space:

Landscaping, passive recreation and storm water detention.

- i. Describe or show on the tentative map any public or private trail systems within common open space of the development:

Refer to attached engineering and landscape plans.

- j. Describe the connectivity of the proposed trail system with existing trails or open space adjacent to or near the property:

No formal trail systems currently exist. However, access through common areas to public lands will be preserved.

- k. If there are ridgelines on the property, how are they protected from development?

Steeper areas of the site are preserved within common area. Refer to attached report and plans for additional details.

- l. Will fencing be allowed on lot lines or restricted? If so, how?

Fencing will be allowed per Washoe County standards. Open fencing may be used in rear yards that border open space/common areas.

m. Identify the party responsible for maintenance of the common open space:

A homeowners association will be established for ongoing maintenance of common areas within Feather River.

6. Is the project adjacent to public lands or impacted by "Presumed Public Roads" as shown on the adopted April 27, 1999 Presumed Public Roads (see Washoe County Engineering website at <http://www.washoecounty.us/pubworks/engineering.htm>). If so, how is access to those features provided?

The project is adjacent to public lands and will maintain pedestrian access through common areas. No presumed public roads have been identified.

7. Is the parcel within the Truckee Meadows Service Area?

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

8. Is the parcel within the Cooperative Planning Area as defined by the Regional Plan?

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, within what city?
------------------------------	--	---------------------------

9. Will a special use permit be required for utility improvement? If so, what special use permits are required and are they submitted with the application package?

A SUP may be required for the proposed waste water treatment facility. This, along with precise details of the facility will be determined with the tentative map review.

10. Has an archeological survey been reviewed and approved by SHPO on the property? If yes, what were the findings?

N/A

11. Indicate the type and quantity of water rights the application has or proposes to have available:

a. Permit #		acre-feet per year	
b. Certificate #		acre-feet per year	
c. Surface Claim #		acre-feet per year	
d. Other #		acre-feet per year	

e. Title of those rights (as filed with the State Engineer in the Division of Water Resources of the Department of Conservation and Natural Resources):

The project will connect to the Truckee Meadows Water Authority (TMWA) system that exists in Wadsworth. A TMWA Discovery Report and NAC compliance letter will be forwarded under a separate cover.

12. Describe the aspects of the tentative subdivision that contribute to energy conservation:

Clustering of units will reduce energy consumption and overall water demands. Additionally, common areas and front yard landscaping will incorporate drought tolerant landscaping and/or xeriscaping design. To the extent possible, solar orientation has been a consideration in the placement of building envelopes.

13. Is the subject property in an area identified Planning and Development as potentially containing rare or endangered plants and/or animals, critical breeding habitat, migration routes or winter range? If so, please list the species and describe what mitigation measures will be taken to prevent adverse impacts to the species:

N/A

14. If private roads are proposed, will the community be gated? If so, is a public trail system easement provided through the subdivision?

N/A

15. Is the subject property located adjacent to an existing residential subdivision? If so, describe how the tentative map complies with each additional adopted policy and code requirement of Article 434, Regional Development Standards within Cooperative Planning Areas and all of Washoe County, in particular, grading within 50 and 200 feet of the adjacent developed properties under 5 acres and parcel matching criteria:

The project provides an appropriate buffer between new homes and the Stampmill Estates subdivision to the east. Additionally, Feather River directly complements Stampmill Estates. Refer to attached report for a more detailed analysis.

16. Are there any applicable policies of the adopted area plan in which the project is located that require compliance? If so, which policies and how does the project comply?

Applicable policies from the Truckee Canyon Area Plan are addressed in the attached report.

17. Are there any applicable area plan modifiers in the Development Code in which the project is located that require compliance? If so, which modifiers and how does the project comply?

N/A

18. Will the project be completed in one phase or is phasing planned? If so, please provide that phasing plan:

Up to 8 phases are planned. Refer to attached report for additional details.

19. Is the project subject to Article 424, Hillside Development? If yes, please address all requirements of the Hillside Ordinance in a separate set of attachments and maps.

Yes No If yes, include a separate set of attachments and maps.

20. Is the project subject to Article 418, Significant Hydrologic Resources? If yes, please address Special Review Considerations within Section 110.418.30 in a separate attachment.

Yes No If yes, include separate attachments.

Grading

Please complete the following additional questions if the project anticipates grading that involves: (1) Disturbed area exceeding twenty-five thousand (25,000) square feet not covered by streets, buildings and landscaping; (2) More than one thousand (1,000) cubic yards of earth to be imported and placed as fill in a special flood hazard area; (3) More than five thousand (5,000) cubic yards of earth to be imported and placed as fill; (4) More than one thousand (1,000) cubic yards to be excavated, whether or not the earth will be exported from the property; or (5) If a permanent earthen structure will be established over four and one-half (4.5) feet high:

21. How many cubic yards of material are you proposing to excavate on site?

Refer to attached engineering plans and reports.

22. How many cubic yards of material are you exporting or importing? If exporting of material is anticipated, where will the material be sent? If the disposal site is within unincorporated Washoe County, what measures will be taken for erosion control and revegetation at the site? If none, how are you balancing the work on-site?

The project is designed to balance earthwork (cuts vs. fills) onsite.

23. Can the disturbed area be seen from off-site? If yes, from which directions, and which properties or roadways? What measures will be taken to mitigate their impacts?

N/A. No off-site visual impacts are anticipated.

24. What is the slope (Horizontal:Vertical) of the cut and fill areas proposed to be? What methods will be used to prevent erosion until the revegetation is established?

Where needed, revegetation will be the preferred method for slope stabilization. Rock rip-rap may be incorporated into channels and/or detention basins as needed.

25. Are you planning any berms and, if so, how tall is the berm at its highest? How will it be stabilized and/or revegetated?

N/A

26. Are retaining walls going to be required? If so, how high will the walls be, will there be multiple walls with intervening terracing, and what is the wall construction (i.e. rockery, concrete, timber, manufactured block)? How will the visual impacts be mitigated?

N/A

27. Will the grading proposed require removal of any trees? If so, what species, how many, and of what size?

N/A

28. What type of revegetation seed mix are you planning to use and how many pounds per acre do you intend to broadcast? Will you use mulch and, if so, what type?

Revegetation seed mix and broadcast amounts will be in compliance with Washoe County standards, as/if needed.

29. How are you providing temporary irrigation to the disturbed area?

Drip irrigation will be provided throughout community common areas.

30. Have you reviewed the revegetation plan with the Washoe Storey Conservation District? If yes, have you incorporated their suggestions?

The Washoe Storey Conservation District is a reviewing agency of this tentative map application and has the ability to request conditions if necessary.

Account Detail

[Back to Search Results](#)

[Change of Address](#)

[Print this Page](#)

Washoe County Parcel Information

Parcel ID	Status	Last Update
08429138	Active	2/15/2017 2:10:05 AM
Current Owner: AGUA FRIA INSURANCE SERVICES LLC 1410 W GUADALUPE RD STE 121 GILBERT, AZ 85233		SITUS: 0 STAMP MILL DR WCTY NV
Taxing District 4000		Geo CD:
Legal Description		
Section 8 Lot Block Range 24 SubdivisionName _REVERSION Township 20		

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2016	\$3,698.65	\$3,698.65	\$0.00	\$0.00	\$0.00
2015	\$3,688.35	\$3,688.35	\$0.00	\$0.00	\$0.00
2014	\$4,303.06	\$4,303.06	\$0.00	\$0.00	\$0.00
2013	\$5,716.90	\$5,974.16	\$0.00	\$0.00	\$0.00
2012	\$5,716.90	\$6,064.32	\$0.00	\$0.00	\$0.00
Total					\$0.00

Important Payment Information

- **ALERTS:** If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a service fee does apply for online credit card payments. See Payment Information for details.

Pay Online

No payment due for this account.


\$0.00


Pay By Check


Please make checks payable to:
WASHOE COUNTY TREASURER


Mailing Address:
P.O. Box 30039
Reno, NV 89520-3039

Overnight Address:
1001 E. Ninth St., Ste D140
Reno, NV 89512-2845

 **Payment Information**

 **Special Assessment District**

 **Installment Date Information**

 **Assessment Information**

Account Detail

[Back to Search Results](#)

[Change of Address](#)

[Print this Page](#)

Washoe County Parcel Information

Parcel ID	Status	Last Update
08433203	Active	2/15/2017 2:10:05 AM
Current Owner: AGUA FRIA INSURANCE SERVICES LLC 1410 W GUADALUPE RD STE 121 GILBERT, AZ 85233		SITUS: 456 STAMP MILL DR WCTY NV
Taxing District 4000	Geo CD:	
Legal Description		
Section Lot A Block Range 24 SubdivisionName STAMP MILL ESTATES 1 Township 20		

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2016	\$374.00	\$374.00	\$0.00	\$0.00	\$0.00
2015	\$371.08	\$371.08	\$0.00	\$0.00	\$0.00
2014	\$371.08	\$371.08	\$0.00	\$0.00	\$0.00
2013	\$1,588.46	\$1,659.94	\$0.00	\$0.00	\$0.00
2012	\$1,524.42	\$1,619.63	\$0.00	\$0.00	\$0.00
Total					\$0.00

Important Payment Information

- ALERTS:** If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a service fee does apply for online credit card payments. See Payment Information for details.

Pay Online

No payment due for this account.


\$0.00


Pay By Check


Please make checks payable to:
WASHOE COUNTY TREASURER


Mailing Address:
 P.O. Box 30039
 Reno, NV 89520-3039

Overnight Address:
 1001 E. Ninth St., Ste D140
 Reno, NV 89512-2845

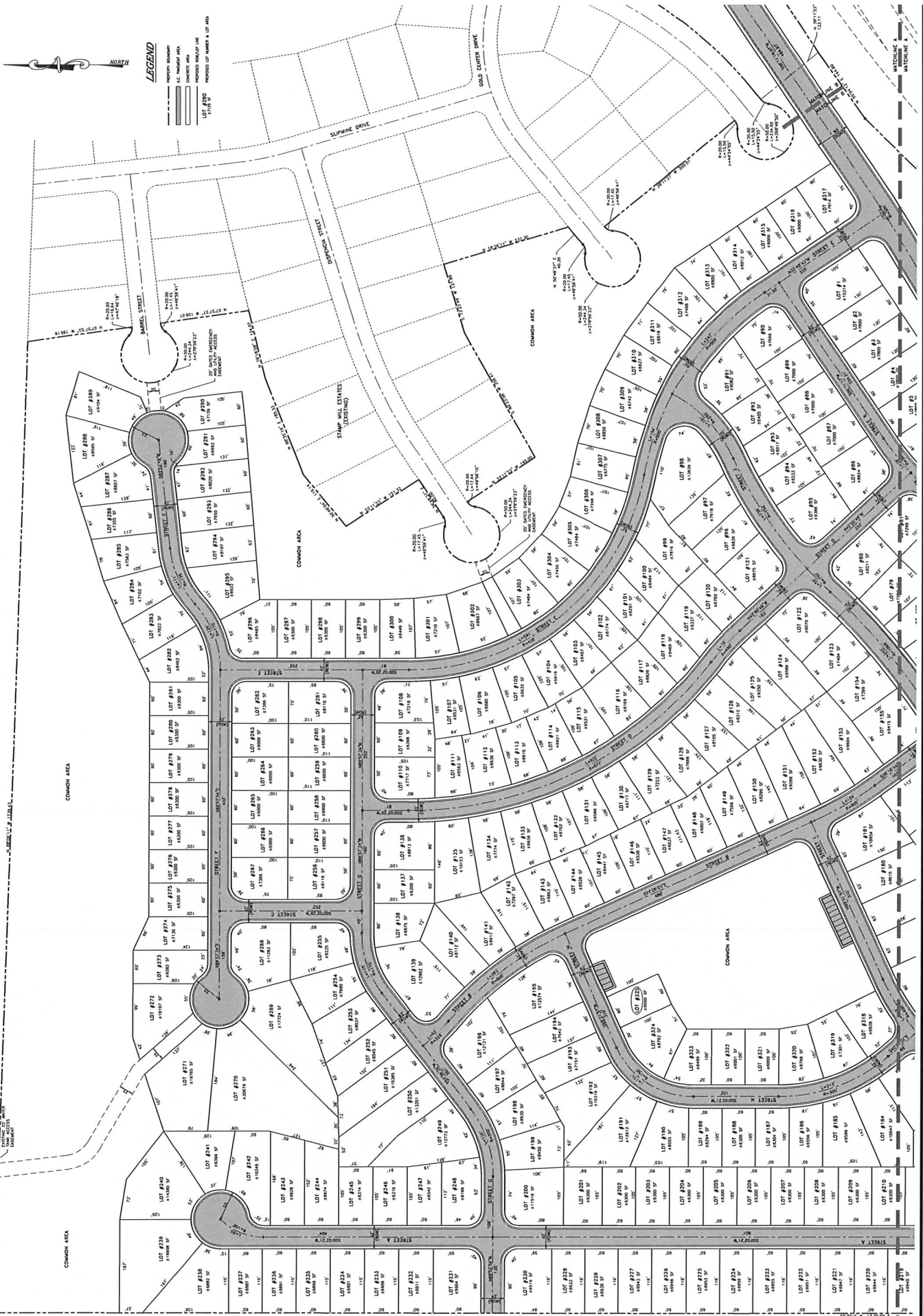
 **Payment Information**

 **Special Assessment District**

 **Installment Date Information**

 **Assessment Information**

FEATHER RIVER SUBDIVISION TENTATIVE MAP



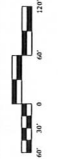
LEGEND

- PROPERTY BOUNDARY
- EASEMENT
- COMMON AREA
- PROPOSED DRIVEWAY LINE
- LOT # AND AREA

ITC

DATE: 07/01/2014
SCALE: 1"=40'
SHEET: 2 OF 7

TENTATIVE MAP
COVER SHEET
SHEET 2 OF 7



04-545-08



February 15, 2017

Regional Street Naming Coordinator
Washoe County
1001 E. Ninth Street
Reno, Nevada 89505

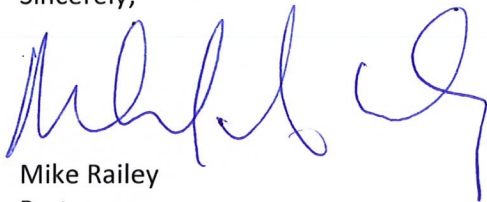
Re: Feather River Street Names

To Whom it May Concern,

At the current time, street names for the Feather River project have not been determined. As such, streets on the attached tentative map are simply labeled as letters (i.e. A, B, C, etc.). The project applicant is working to develop names that are reflective of the site history and culture and will be bringing a list forward for review by the Regional Street Naming Coordinator. This will occur prior to any final map being recorded.

Please do not hesitate to contact me at mrailey@rubicondesigngroup.com or 425-4800 should you have any questions or concerns. Thank you.

Sincerely,



Mike Railey
Partner

FEATHER RIVER
TRAFFIC STUDY

FEBRUARY, 2017



Prepared by:
Solaegui Engineers, Ltd.
715 H Street
Sparks, Nevada 89431
(775) 358-1004

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

INTRODUCTION 4

 STUDY AREA 4

 EXISTING AND PROPOSED LAND USES 4

 EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS 4

TRIP GENERATION 6

TRIP DISTRIBUTION AND ASSIGNMENT 6

EXISTING AND PROJECTED TRAFFIC VOLUMES 9

INTERSECTION CAPACITY ANALYSIS 9

SITE PLAN REVIEW 16

RECOMMENDATIONS 16

APPENDIX 18

LIST OF FIGURES

FIGURE 1 - VICINITY MAP 5

FIGURE 2 - TRIP DISTRIBUTION 7

FIGURE 3 - TRIP ASSIGNMENT 8

FIGURE 4 - EXISTING TRAFFIC VOLUMES 10

FIGURE 5 - EXISTING PLUS PROJECT TRAFFIC VOLUMES 11

FIGURE 6 - 2027 BASE TRAFFIC VOLUMES 12

FIGURE 7 - 2027 BASE PLUS PROJECT TRAFFIC VOLUMES 13

FIGURE 8 - ON-SITE STREET SECTIONS AND ADT VOLUMES 17

FEATHER RIVER

TRAFFIC STUDY

EXECUTIVE SUMMARY

The Feather River development is located in Washoe County, Nevada. The project site is located north of Interstate 80 and west of State Route 427. The project site is currently undeveloped land. The purpose of this study is to address the project's impact upon the adjacent street network. The State Route 427 intersections with Stampmill Drive and the I-80 eastbound and westbound ramps have been identified for AM and PM peak hour capacity analysis for the existing, existing plus project, 2027 base and 2027 base plus project scenarios.

The Feather River development will consist of the construction of 325 single family dwelling units. Project access will be provided from an extension of Stampmill Drive via State Route 427. The project is expected to generate 3,094 average daily trips with 244 trips occurring during the AM peak hour and 325 trips occurring during the PM peak hour.

Traffic generated by the Feather River development will have some impact on the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping or traffic control improvements comply with Washoe County and Nevada Department of Transportation requirements.

It is recommended that the northbound left turn lane at the State Route 427/Stampmill Drive intersection be improved to include a minimum of 325 feet of storage/deceleration length.

It is recommended that the project roadways, cul-de-sacs and intersections be designed to conform to Washoe County street standards.

INTRODUCTION

STUDY AREA

The Feather River development is located in Washoe County, Nevada. The project site is located north of Interstate 80 and west of State Route 427. Figure 1 shows the approximate location of the project site. The purpose of this study is to address the project's impact upon the adjacent street network. The State Route 427 intersections with Stampmill Drive and the I-80 eastbound and westbound ramps have been identified for AM and PM peak hour capacity analysis for the existing, existing plus project, 2027 base and 2027 base plus project scenarios.

EXISTING AND PROPOSED LAND USES

The project site is currently undeveloped land. Adjacent development generally include single family homes directly to the east and a convenience store further east across State Route 427. Undeveloped land exists to the north and west and I-80 exists to the south. The Feather River development will consist of the construction of 325 single family dwelling units. Project access will be provided from an extension of Stampmill Drive via State Route 427.

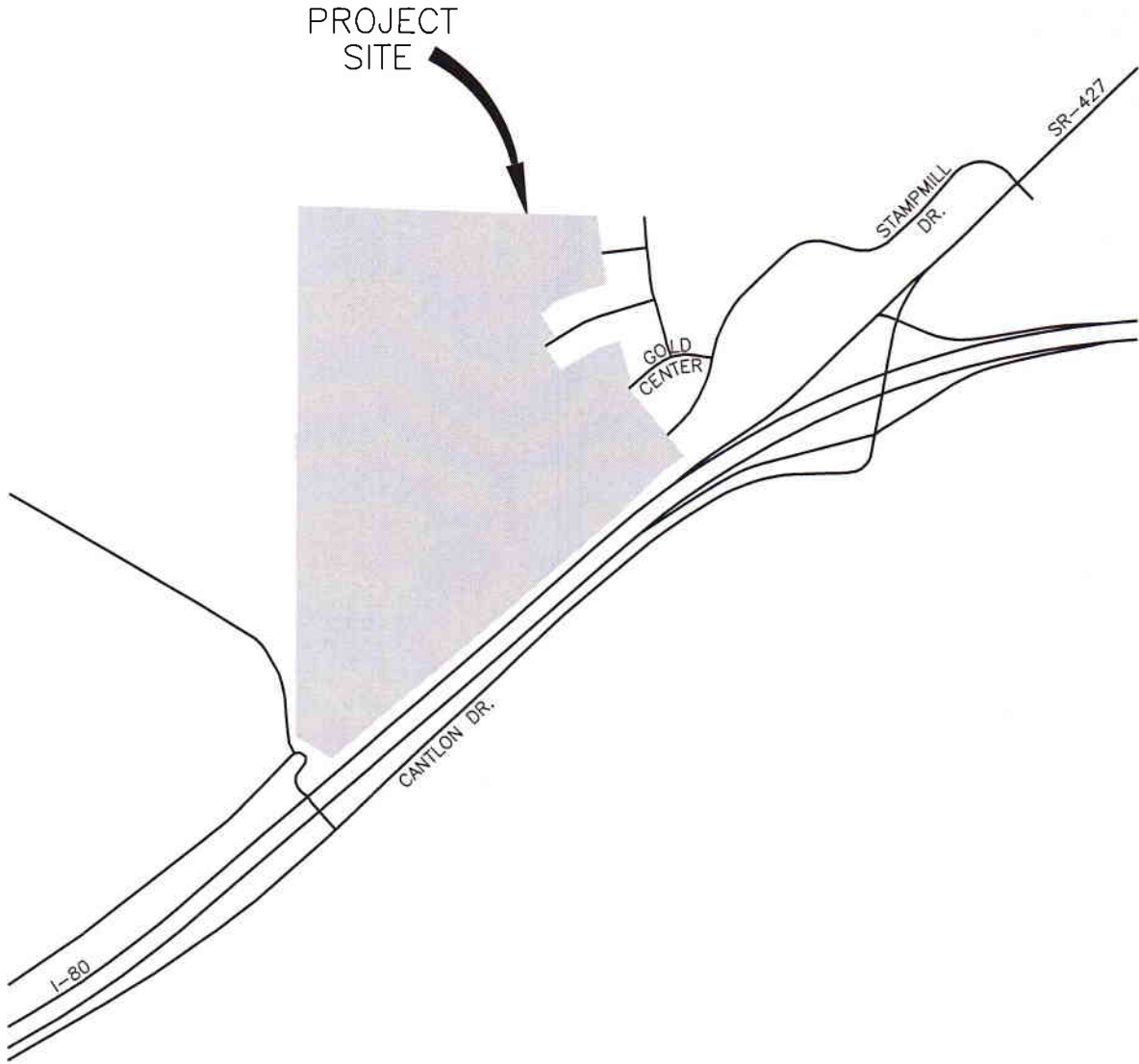
EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

State Route 427 is a two-lane roadway with one through lane in each direction in the vicinity of the site. The speed limit is posted for 55 miles per hour approximately 500 feet north of Stampmill Drive. The speed limit is not posted south of Stampmill Drive. Roadway improvements generally include narrow paved shoulders with solid white edgelines and a double yellow centerline. The roadway is named Cantlon Drive south of the I-80 eastbound ramp intersection.

Stampmill Drive is a two-lane roadway with one lane in each direction from State Route 427 to the project's east property line. The speed limit is not posted but assumed to be 25 miles per hour. Roadway improvements generally include curb and gutter on both sides of the street. Sidewalk exists on both sides of the street in developed areas. With development of the project, Stampmill Drive will be realigned to parallel the existing roadway section. The realignment will begin northeast of Gold Center Drive.

Interstate 80 is a four-lane, divided freeway with two lanes in each direction in the vicinity of the site. The speed limit is posted for 70 miles per hour. The I-80/Wadsworth interchange is a diamond interchange with single lane on and off-ramps.

The I-80/Eastbound Ramp intersection is an unsignalized four-leg intersection with stop sign control at the north, south and west approaches. The north approach contains one shared left turn-through lane. The south approach contains one shared through-right turn lane. The west approach contains one shared left turn-through-right turn lane. The east approach is the on-ramp to eastbound I-80.



FEATHER RIVER
VICINITY MAP
FIGURE 1

The I-80/Westbound Ramp intersection is an unsignalized four-leg intersection with stop sign control at the east approach. The northbound left turn movement yields to southbound through traffic and stops for southbound right turn traffic. The north approach contains one through lane and one right turn lane separated by a large corner island. The south approach contains one shared left turn-through lane. The east approach contains one shared left turn-through-right turn lane. The west approach is the on-ramp to westbound I-80.

The State Route 427/Stampmill Drive intersection is an unsignalized four-leg intersection with stop sign control at the west Stampmill Drive approach. The east approach is a driveway serving a convenience market. The north approach contains one shared left turn-through-right turn lane. The south approach contains one left turn lane and a shared through-right turn lane. The west Stampmill Drive approach and the east driveway approach contain one shared left turn-through-right turn lane.

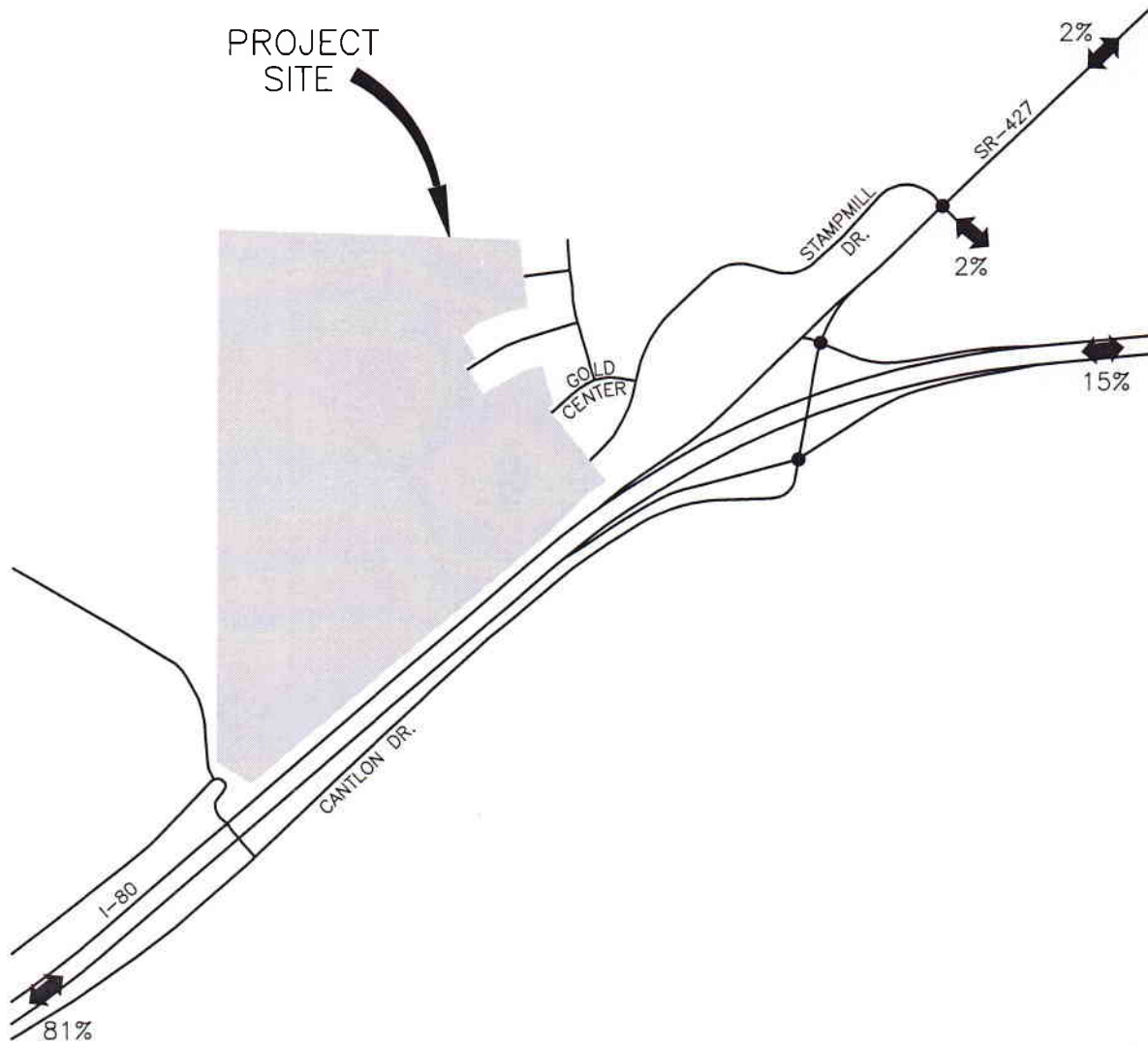
TRIP GENERATION

In order to assess the magnitude of traffic impacts of the proposed development on the adjacent street network, trip generation rates and peak hours had to be determined. Trip generation rates were obtained from the *Ninth Edition of ITE Trip Generation* (2012) for Land Use 210 “Single Family Detached Housing”. The proposed Feather River development will consist of the construction of a total of 325 single family detached homes. Trip generation was calculated for the weekday peak hours occurring between 7:00 AM and 9:00 AM and 4:00 PM and 6:00 PM, which correspond to the peak hours of adjacent street traffic. Table 1 shows a summary of the average weekday traffic (ADT) volumes and weekday peak hour volumes generated by the project.

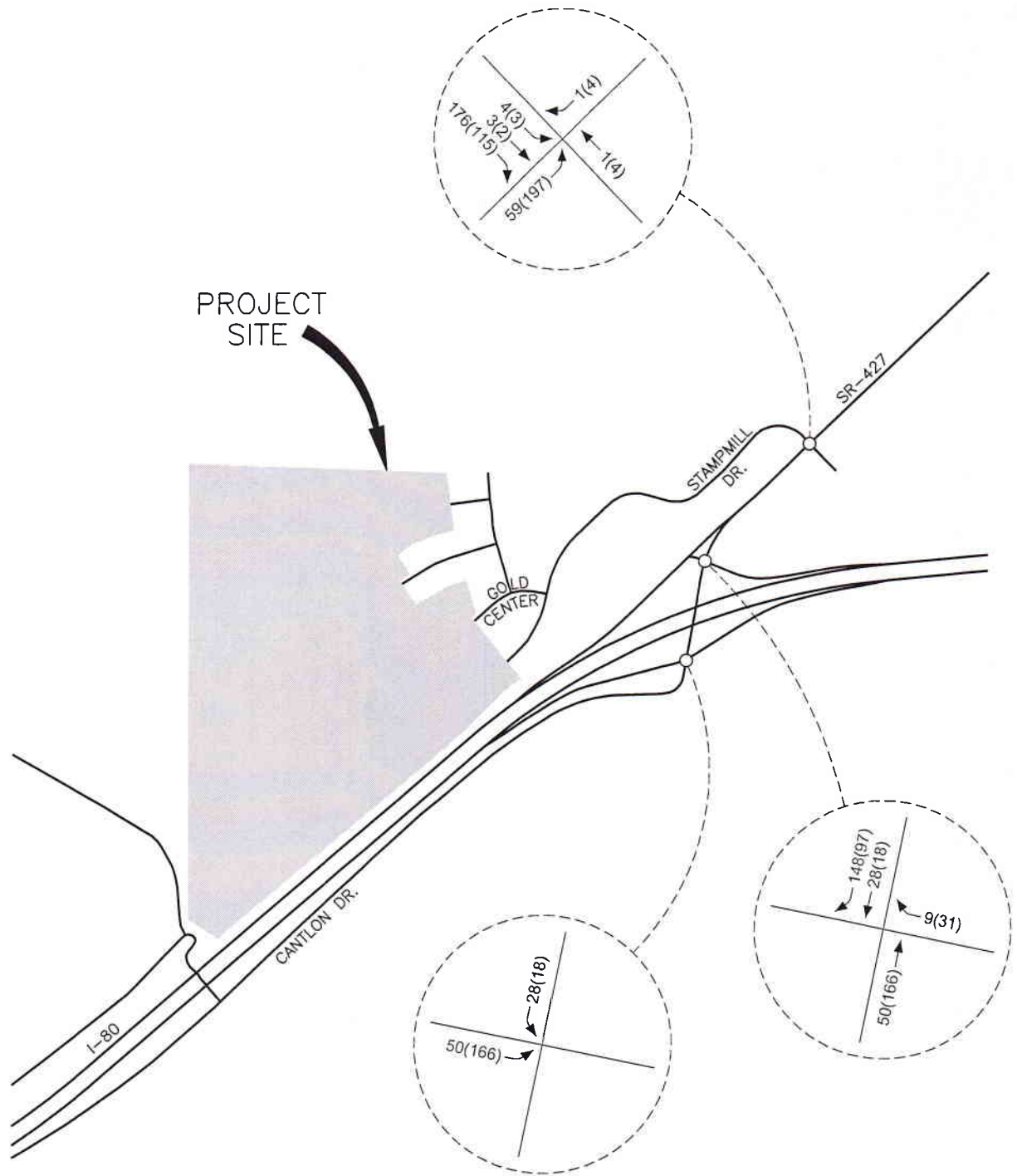
LAND USE/VARIABLE	ADT	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Single Family Homes (325 D.U.)	3,094	61	183	244	205	120	325

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of the project traffic to the key intersections was based on existing peak hour traffic patterns and the locations of attractions and productions in the area. Figure 2 shows the anticipated trip distribution. The peak hour trips shown in Table 1 were subsequently assigned to the key intersections based on the trip distribution. Figure 3 shows the trip assignment at the key intersections for the AM and PM peak hours.



FEATHER RIVER
TRIP DISTRIBUTION
FIGURE 2



LEGEND
 - AM PEAK HOUR
 (-) PM PEAK HOUR

FEATHER RIVER
 TRIP ASSIGNMENT
 FIGURE 3

EXISTING AND PROJECTED TRAFFIC VOLUMES

Figure 4 shows the existing traffic volumes at the key intersections during the AM and PM peak hours. The existing traffic volumes at the key intersections were obtained from peak hour count data provided by the Nevada Department of Transportation with updated traffic counts conducted in February of 2017. Figure 5 shows the existing plus project traffic volumes at the key intersections during the AM and PM peak hours. The existing plus project volumes were obtained by adding the trip assignment volumes shown on Figure 3 to the existing volumes shown on Figure 4. Figure 6 shows the 2027 base traffic volumes at the key intersections during the AM and PM peak hours. The 2027 base traffic volumes were estimated by applying a 2.0% average annual growth rate to the existing traffic volumes. It should be noted that 10-year historic traffic count data obtained from the Nevada Department of Transportation's (NDOT) Annual Traffic Report indicated negative growth rates on State Route 427 and each interchange ramp. However, the 2.0% growth rate was used in order to ensure conservative results. Figure 7 shows the 2027 base plus project traffic volumes. The 2027 base plus project volumes were obtained by adding the trip assignment volumes shown on Figure 3 to the 2027 base volumes shown on Figure 6.

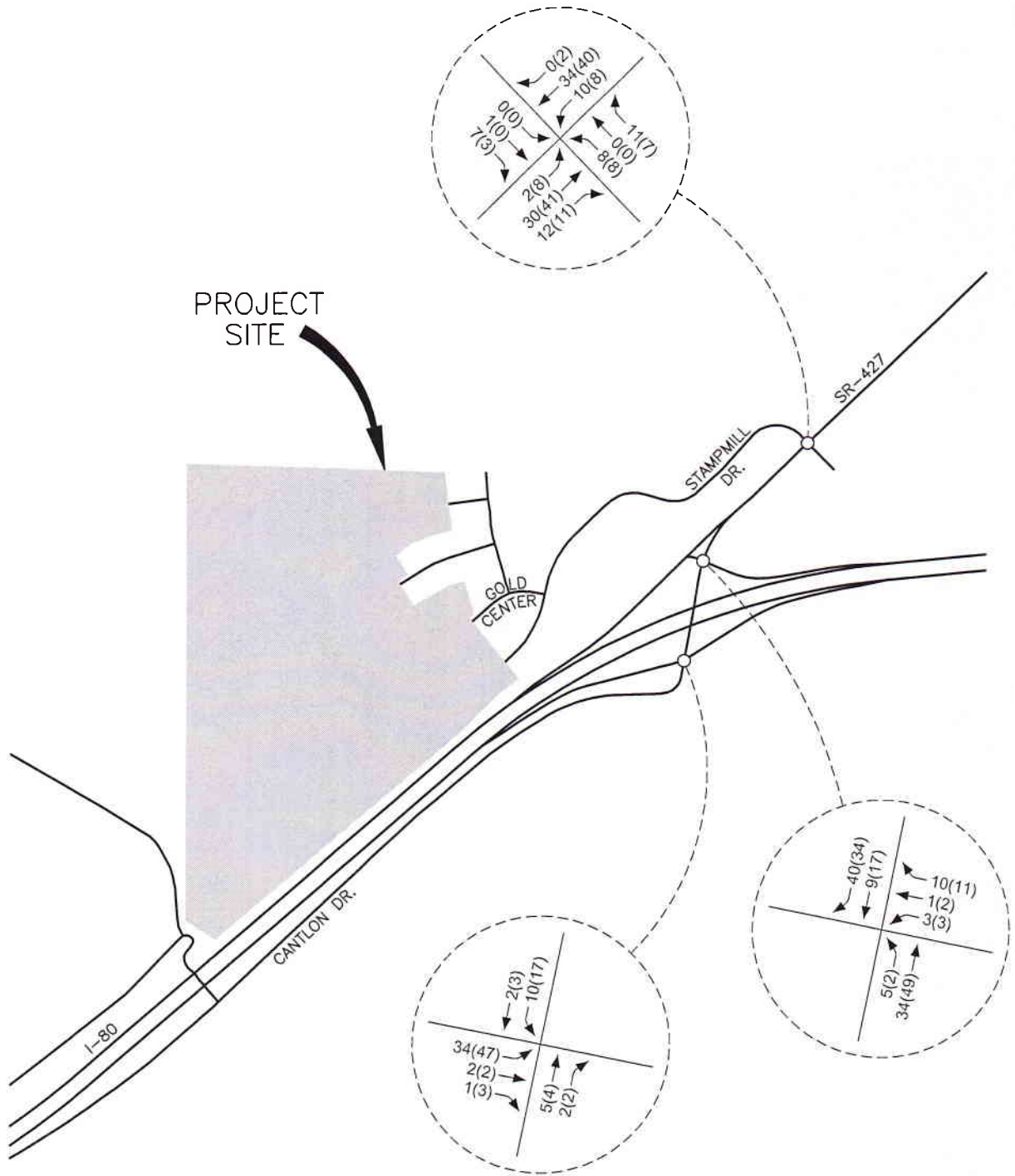
INTERSECTION CAPACITY ANALYSIS

The key intersections were analyzed for capacity based on procedures presented in the 2010 *Highway Capacity Manual (HCM)*, prepared by the Transportation Research Board, for unsignalized intersections using the latest version of the Highway Capacity computer software.

The result of capacity analysis is a level of service rating for each minor movement. Level of service is a qualitative measure of traffic operating conditions where a letter grade "A" through "F", corresponding to progressively worsening traffic operation, is assigned to the intersection minor movement or approach.

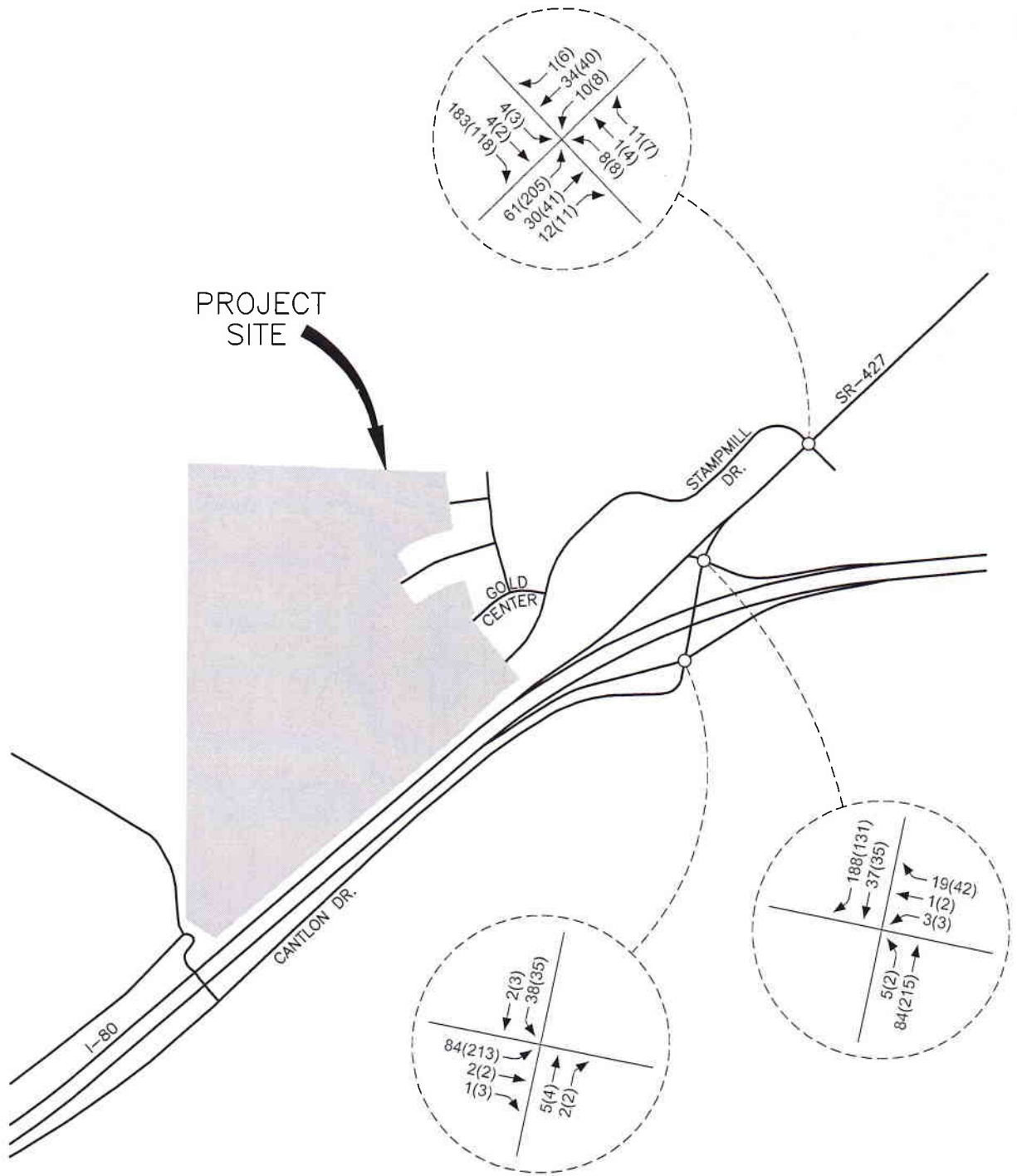
The *Highway Capacity Manual* defines level of service for stop controlled intersections in terms of computed or measured control delay for each minor movement. Level of service is not defined for the intersection as a whole. The LOS criteria for unsignalized intersections is shown in Table 2.

LEVEL OF SERVICE	DELAY RANGE (SEC/VEH)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50



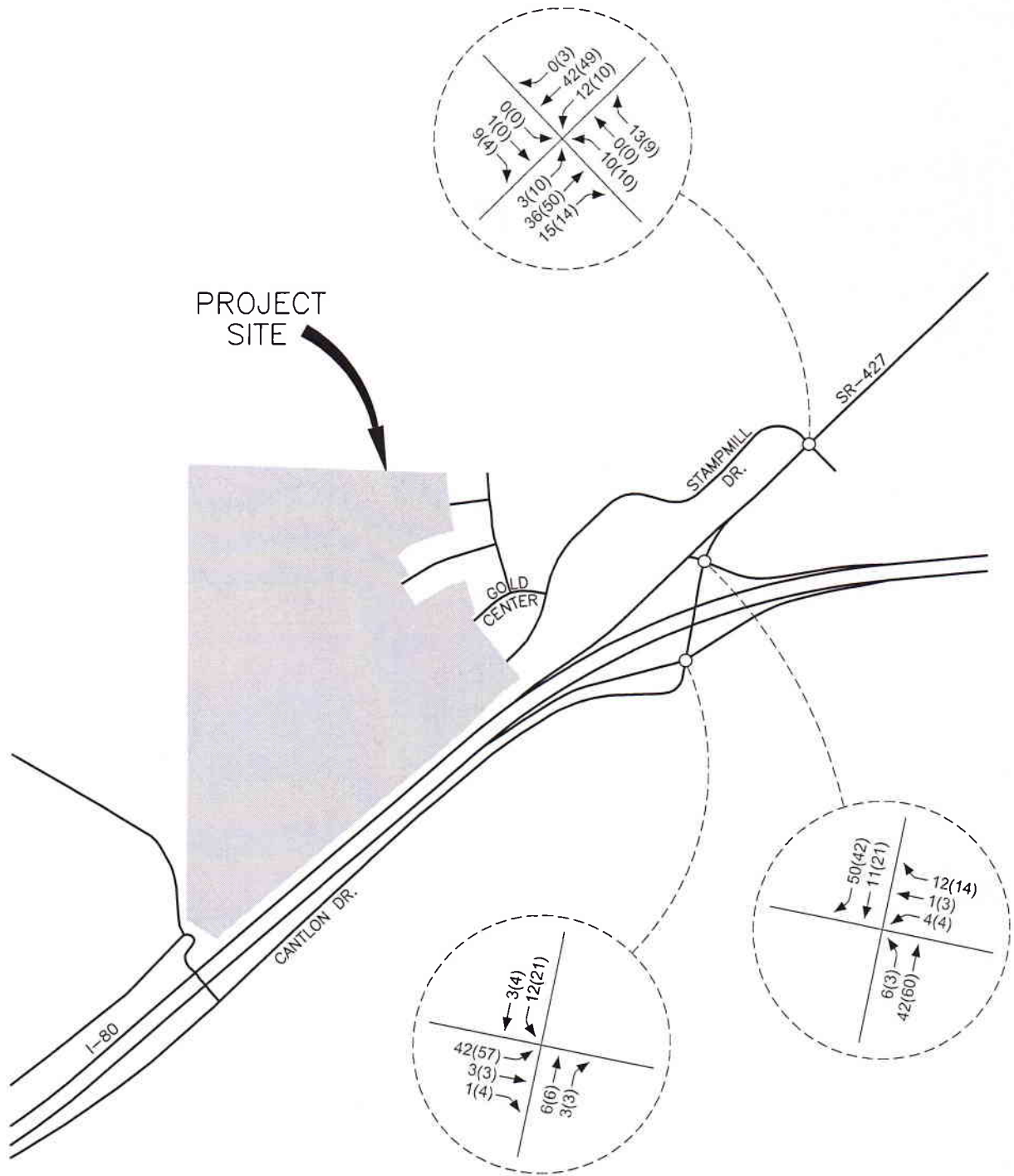
LEGEND
 - AM PEAK HOUR
 (-) PM PEAK HOUR

FEATHER RIVER
 EXISTING TRAFFIC VOLUMES
 FIGURE 4



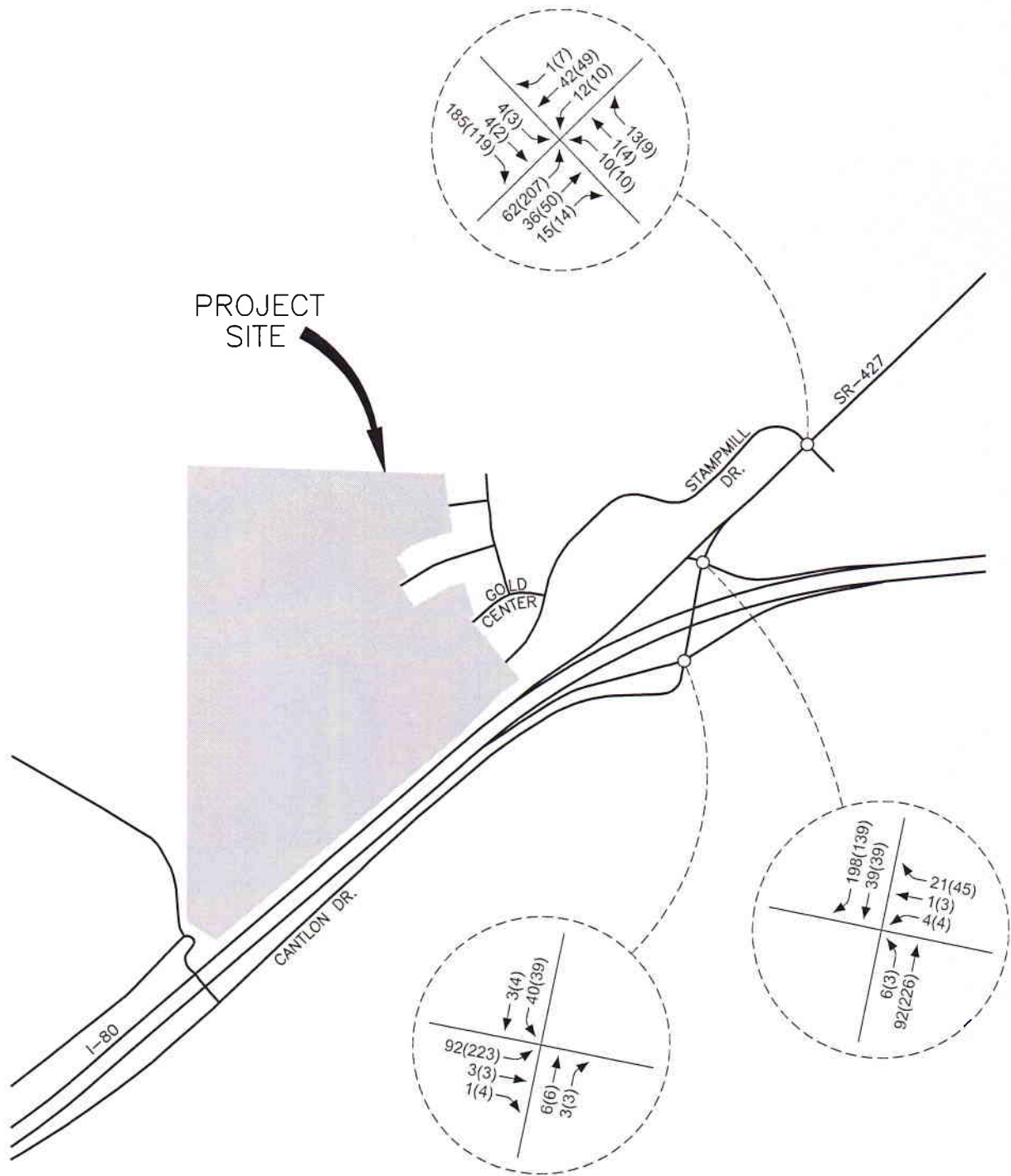
LEGEND
 — AM PEAK HOUR
 (-) PM PEAK HOUR

FEATHER RIVER
EXISTING PLUS PROJECT TRAFFIC VOLUMES
FIGURE 5



LEGEND
 — AM PEAK HOUR
 (—) PM PEAK HOUR

FEATHER RIVER
2027 BASE TRAFFIC VOLUMES
FIGURE 6



LEGEND
 - AM PEAK HOUR
 (-) PM PEAK HOUR

FEATHER RIVER
 2027 BASE PLUS PROJECT TRAFFIC VOLUMES
 FIGURE 7

Table 3 shows a summary of the level of service and delay results at the key intersections for the existing, existing plus project, 2027 base and 2027 base plus project scenarios. The capacity worksheets are included in the Appendix.

TABLE 3 INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS								
INTERSECTION	EXISTING		EXISTING + PROJECT		2027 BASE		2027 BASE + PROJECT	
	AM	PM	AM	PM	AM	PM	AM	PM
SR-427 & Stampmill Drive Stop at East and West Legs								
EB Left-Thru-Right	A8.6	A8.5	A9.5	A9.4	A8.7	A8.6	A9.6	A9.5
WB Left-Thru-Right	A8.9	A9.0	B10.5	B13.9	A9.0	A9.2	B10.7	B14.3
NB Left	A7.3	A7.3	A7.4	A7.7	A7.3	A7.3	A7.4	A7.7
SB Left	A7.3	A7.3	A7.3	A7.3	A7.3	A7.4	A7.3	A7.4
SR-427 & I-80 WB Ramps Stop at East Leg								
WB Left-Thru-Right	A8.7	A8.8	A9.1	A10.0	A8.8	A9.0	A9.2	B10.2
NB Left	A7.3	A7.3	A7.8	A7.6	A7.4	A7.4	A7.8	A7.6
SR-427 & I-80 EB Ramps Stop at North, South, West Legs								
EB Left-Thru-Right	A7.4	A7.4	A7.8	A8.9	A7.4	A7.5	A7.9	A9.1
NB Thru-Right	A6.9	A6.9	A7.1	A7.4	A6.9	A7.0	A7.1	A7.4
SB Left-Thru	A7.3	A7.4	A7.6	A8.0	A7.3	A7.4	A7.6	A8.0

State Route 427/Stampmill Drive Intersection

The State Route 427/Stampmill Drive intersection was analyzed as an unsignalized four-leg intersection with stop control at the east and west approaches for all scenarios. The intersection minor movements currently operate at LOS A during the AM and PM peak hours. For the existing plus project traffic volumes the intersection minor movements are anticipated to operate at LOS B or better during the AM and PM peak hours. For the 2027 base traffic volumes the intersection minor movements are anticipated to operate at LOS A during the AM and PM peak hours. For the 2027 base plus project traffic volumes the intersection minor movements are anticipated to operate at LOS B or better during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios.

The need for a southbound right turn lane at the State Route 427/Stampmill Drive intersection was reviewed based on NDOT's access management standards. The standards indicate that right turn lanes are typically required on roadways with speeds greater than 45 miles per hour. However, a right turn lane is not recommended at this location due to the very low right turn volume and LOS B or better operation at the intersection.

The existing northbound to westbound left turn pocket at the State Route 427/Stampmill Drive intersection was reviewed for storage and deceleration requirements. Storage requirements were calculated based on NDOT's unsignalized intersection criteria of provided three minutes of storage during the peak hours. Approximately 250 feet of storage length is required for the projected left turn volume. NDOT's access management standards indicate that deceleration length is related to the speed of the roadway. The speed limit is not posted on the northbound segment of State Route 427 south of Stampmill Drive. It is suggested that a minimum of 75 feet of deceleration length be provided based on a 35 mile per hour speed on State Route 427. A total length of 325 feet is therefore required for the northbound left turn lane. The existing left turn lane contains a total of ±125 feet of storage and deceleration length which does not meet the 325 feet total length requirement. It is recommended that the northbound to westbound left turn lane at the State Route 427/Stampmill Drive intersection be improved to include a minimum of 325 feet of storage/deceleration length.

State Route 427/I-80 Westbound Ramp Intersection

The State Route 427/I-80 Westbound Ramp intersection was analyzed as an unsignalized four-leg intersection with stop control at the east approach for all scenarios. The intersection minor movements currently operate at LOS A during the AM and PM peak hours. For the existing plus project volumes the intersection minor movements continue to operate at LOS A during the AM and PM peak hours. For the 2027 base traffic volumes the intersection minor movements are anticipated to operate at LOS A during the AM and PM peak hours. For the 2027 base plus project volumes the intersection minor movements will operate at LOS B or better during the AM and PM peak hours. The northbound left turn movement is required to stop and wait for gaps in the southbound right turn traffic stream. This stop controlled movement will operate at LOS A during the AM and PM peak hours for all scenarios. The intersection was analyzed with the existing approach lanes for all scenarios.

State Route 427/I-80 Eastbound Ramp Intersection

The State Route 427/I-80 Eastbound Ramp intersection was analyzed as an unsignalized four-leg intersection with stop control at the north, south and west approaches for all scenarios. All approaches currently operate at LOS A during the AM and PM peak hours. For the existing plus project volumes all approaches continue to operate at LOS A during the AM and PM peak hours. For the 2027 base traffic volumes all approaches operate at LOS A during the AM and PM peak hours. For the 2027 base plus project traffic volumes all approaches operate at LOS A during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios.

SITE PLAN REVIEW

A copy of the site plan for the Feather River development is included in this submittal. The site plan indicates that project access will be provided from Stampmill Drive via State Route 427. Stampmill Drive will be realigned to parallel the existing roadway. The realignment will begin approximately 400 feet northeast of Gold Center Drive. Access to the homes in the existing subdivision will then be provided from an extension of Gold Center Drive between the existing and new Stampmill Drive segments. Gated emergency access will be provided from the existing Barrel Street and Dispensia Street cul-de-sacs.

The site plan indicates that Stampmill Drive and Roads A through D are collector streets and the remaining on-site streets are local streets. Figure 8 shows the collector and local streets as indicated on the site plan. Average daily traffic volumes on these streets were subsequently reviewed in order to determine if they meet Washoe County capacity thresholds. Washoe County street standards indicate that local streets can carry 1,000 ADT or less and collector streets can carry up to 7,300 ADT. Collector streets with residential driveways can carry a maximum volume of 2,000 ADT. Figure 8 also shows the average daily traffic volumes projections on the on-site streets. All of the on-site collector and local streets will meet Washoe County street capacity thresholds. It is recommended that the project roadways, cul-de-sacs and intersections be designed to conform to Washoe County street standards.

The site plan shows that two of the main access streets (Roads B and C) from Stampmill Drive will be long, straight street segments which may contribute to speeding. It is suggested that all-way stop control be installed at a midpoint intersection on each roadway.

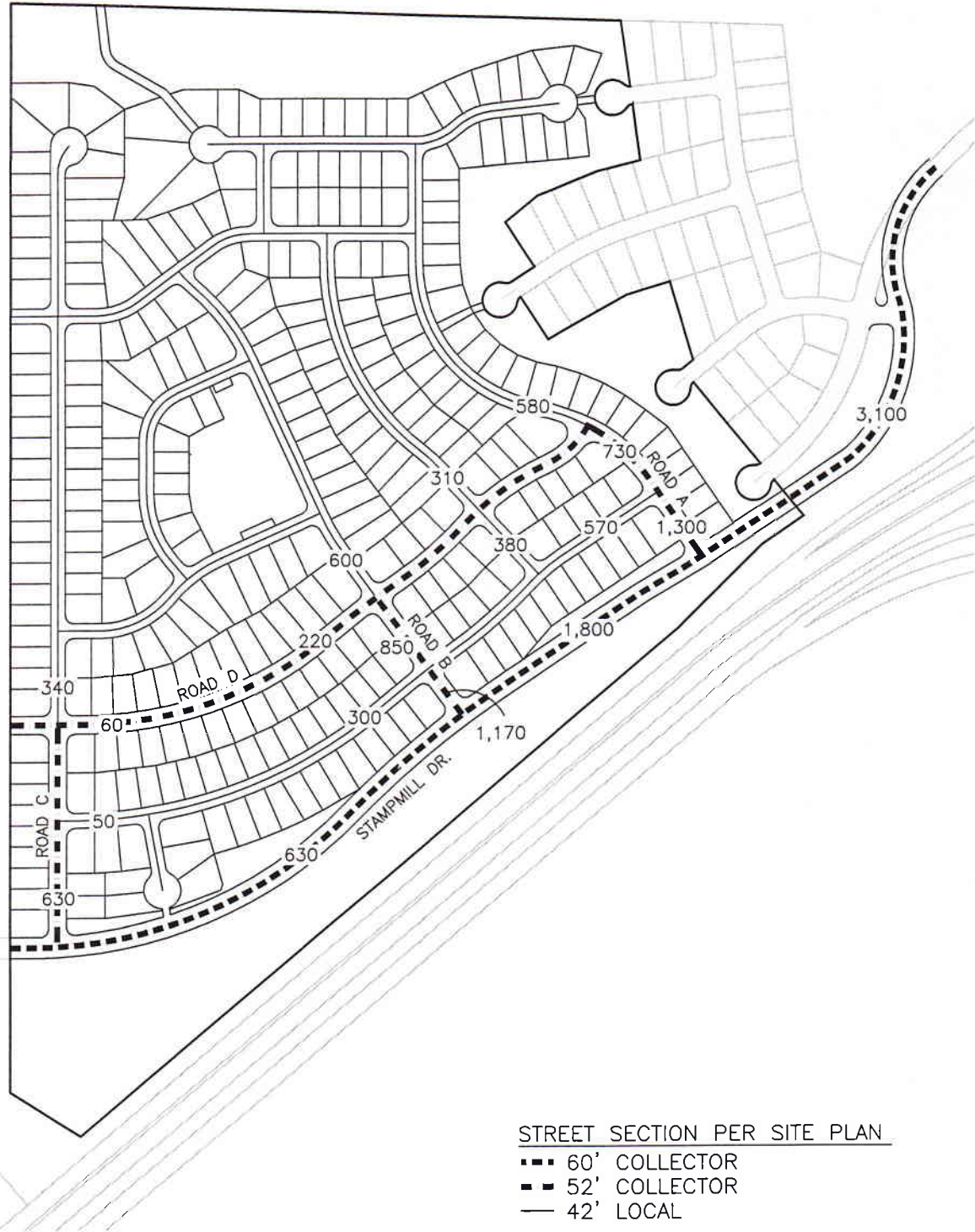
RECOMMENDATIONS

Traffic generated by the Feather River development will have some impact on the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping or traffic control improvements comply with Washoe County and Nevada Department of Transportation requirements.

It is recommended that the northbound left turn lane at the State Route 427/Stampmill Drive intersection be improved to include a minimum of 325 feet of storage/deceleration length.

It is recommended that the project roadways, cul-de-sacs and intersections be designed to conform to Washoe County street standards.



FEATHER RIVER
ON-SITE STREET SECTIONS AND ADT VOLUMES
FIGURE 8

APPENDIX

Trip Generation Summary - Alternative 1

Project: New Project
 Alternative: Alternative 1

Open Date: 2/7/2017
 Analysis Date: 2/7/2017

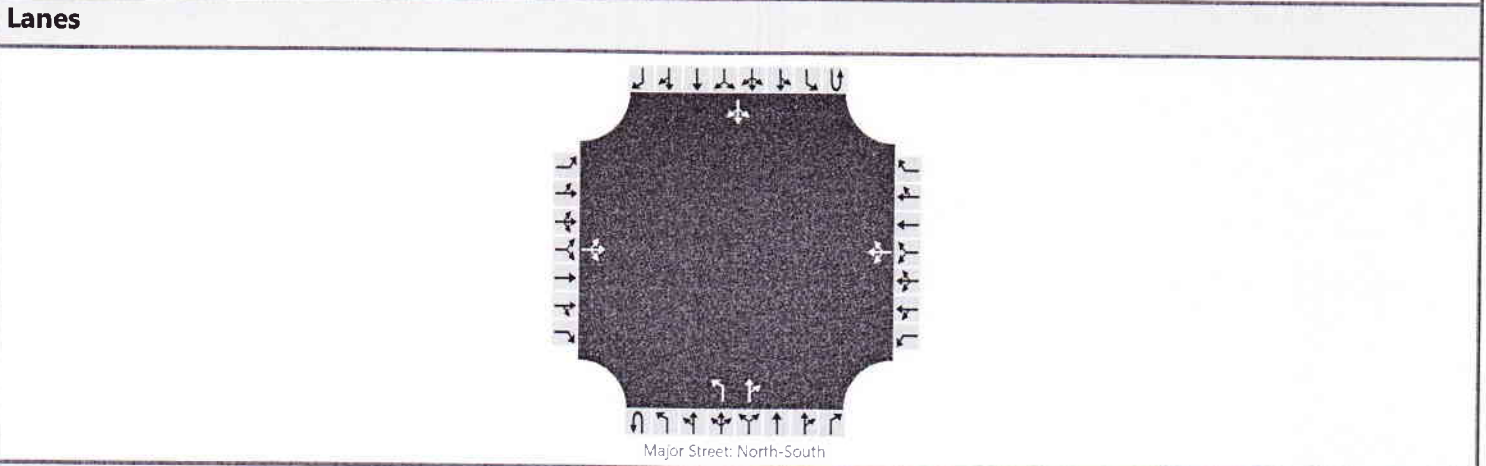
ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
210	SFHOUSE 1	1547	1547	3094	61	183	244	205	120	325
	325 Dwelling Units									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

HCS 2010 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	MSH			Intersection	Sr-427 & Stampmill		
Agency/Co.	Solaegui Engineers			Jurisdiction	NDOT		
Date Performed	2/7/2017			East/West Street	Stampmill Drive		
Analysis Year	2017			North/South Street	SR-427		
Time Analyzed	AM Existing			Peak Hour Factor	0.90		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Feather River						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	0	1	0	
Configuration			LTR				LTR			L		TR			LTR		
Volume, V (veh/h)		0	1	7		8	0	11		2	30	12		10	34	0	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No				No				No			
Median Type/Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			9			21			2					11			
Capacity, c (veh/h)			996			949			1571					1561			
v/c Ratio			0.01			0.02			0.00					0.01			
95% Queue Length, Q ₉₅ (veh)			0.0			0.1			0.0					0.0			
Control Delay (s/veh)			8.6			8.9			7.3					7.3			
Level of Service, LOS			A			A			A					A			
Approach Delay (s/veh)		8.6				8.9				0.3				1.7			
Approach LOS		A				A											

HCS 2010 Two-Way Stop-Control Report

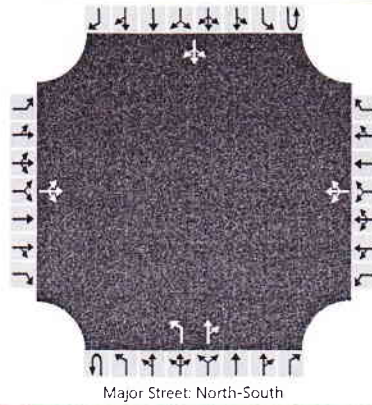
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	PM Existing
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	Sr-427 & Stampmill
Jurisdiction	NDOT
East/West Street	Stampmill Drive
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	0	1	0	
Configuration			LTR				LTR			L		TR			LTR		
Volume, V (veh/h)		0	0	3		8	0	7		8	41	11		8	40	2	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No				No				No			
Median Type/Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			3				17				9					9	
Capacity, c (veh/h)			1024				906				1561					1545	
v/c Ratio			0.00				0.02				0.01					0.01	
95% Queue Length, Q ₉₅ (veh)			0.0				0.1				0.0					0.0	
Control Delay (s/veh)			8.5				9.0				7.3					7.3	
Level of Service, LOS			A				A				A					A	
Approach Delay (s/veh)		8.5				9.0				1.0				1.2			
Approach LOS		A				A											

HCS 2010 Two-Way Stop-Control Report

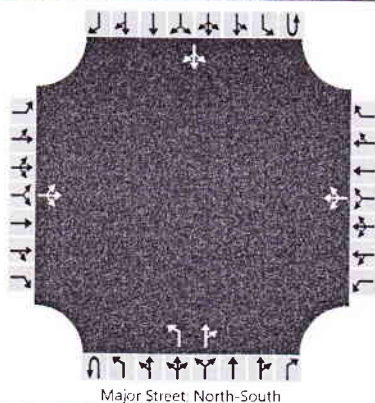
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	AM Existing + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	Sr-427 & Stampmill
Jurisdiction	NDOT
East/West Street	Stampmill Drive
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume, V (veh/h)		4	4	183		8	1	11		61	30	12		10	34	1
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			211				22				68				11	
Capacity, c (veh/h)			1011				681				1570				1561	
v/c Ratio			0.21				0.03				0.04				0.01	
95% Queue Length, Q ₉₅ (veh)			0.8				0.1				0.1				0.0	
Control Delay (s/veh)			9.5				10.5				7.4				7.3	
Level of Service, LOS			A				B				A				A	
Approach Delay (s/veh)		9.5				10.5				4.4				1.7		
Approach LOS		A				B										

HCS 2010 Two-Way Stop-Control Report

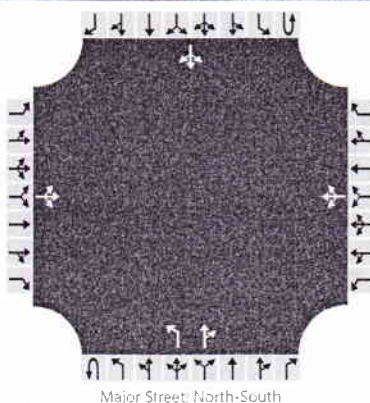
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	PM Existing + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	Sr-427 & Stampmill
Jurisdiction	NDOT
East/West Street	Stampmill Drive
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume, V (veh/h)		3	2	118		8	4	7		205	41	11		8	40	6
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

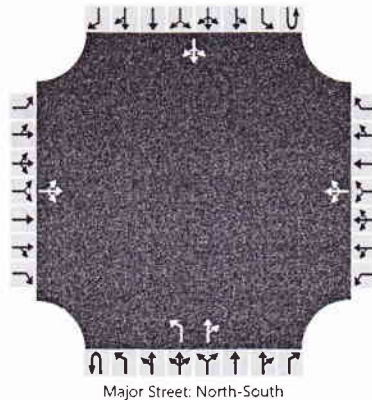
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			136				21				228				9	
Capacity, c (veh/h)			958				427				1554				1545	
v/c Ratio			0.14				0.05				0.15				0.01	
95% Queue Length, Q ₉₅ (veh)			0.5				0.2				0.5				0.0	
Control Delay (s/veh)			9.4				13.9				7.7				7.3	
Level of Service, LOS			A				B				A				A	
Approach Delay (s/veh)		9.4				13.9				6.1				1.1		
Approach LOS		A				B										

HCS 2010 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Sr-427 & Stampmill
Agency/Co.	Solaegui Engineers	Jurisdiction	NDOT
Date Performed	2/7/2017	East/West Street	Stampmill Drive
Analysis Year	2027	North/South Street	SR-427
Time Analyzed	AM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Feather River		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	0	1	0	
Configuration			LTR				LTR			L		TR			LTR		
Volume, V (veh/h)		0	1	9		10	0	13		3	36	15		12	42	0	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No					No						
Median Type/Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			11			25				3					13		
Capacity, c (veh/h)			989			923				1559					1546		
v/c Ratio			0.01			0.03				0.00					0.01		
95% Queue Length, Q ₉₅ (veh)			0.0			0.1				0.0					0.0		
Control Delay (s/veh)			8.7			9.0				7.3					7.3		
Level of Service, LOS			A			A				A					A		
Approach Delay (s/veh)		8.7				9.0				0.4				1.6			
Approach LOS		A				A											

HCS 2010 Two-Way Stop-Control Report

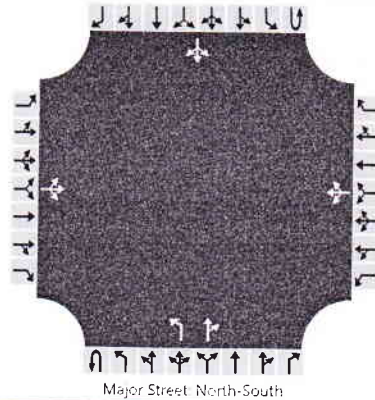
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	PM Base
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	Sr-427 & Stampmill
Jurisdiction	NDOT
East/West Street	Stampmill Drive
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume, V (veh/h)		0	0	4		10	0	9		10	50	14		10	49	3
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			4				21				11				11	
Capacity, c (veh/h)			1010				875				1546				1527	
v/c Ratio			0.00				0.02				0.01				0.01	
95% Queue Length, Q ₉₅ (veh)			0.0				0.1				0.0				0.0	
Control Delay (s/veh)			8.6				9.2				7.3				7.4	
Level of Service, LOS			A				A				A				A	
Approach Delay (s/veh)		8.6				9.2				1.0				1.2		
Approach LOS		A				A										

HCS 2010 Two-Way Stop-Control Report

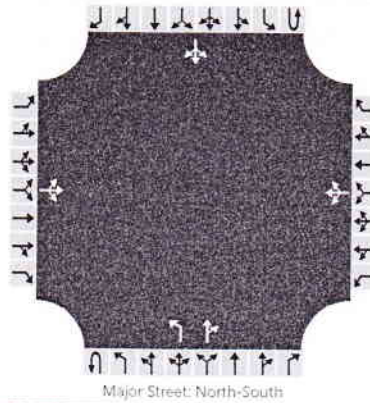
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	Sr-427 & Stampmill
Jurisdiction	NDOT
East/West Street	Stampmill Drive
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	0	1	0	
Configuration			LTR				LTR			L		TR			LTR		
Volume, V (veh/h)		4	4	185		10	1	13		62	36	15		12	42	1	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No				No				No			
Median Type/Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			214			26				69					13		
Capacity, c (veh/h)			997			654				1558					1546		
v/c Ratio			0.21			0.04				0.04					0.01		
95% Queue Length, Q ₉₅ (veh)			0.8			0.1				0.1					0.0		
Control Delay (s/veh)			9.6			10.7				7.4					7.3		
Level of Service, LOS			A			B				A					A		
Approach Delay (s/veh)		9.6				10.7				4.1				1.6			
Approach LOS		A				B											

HCS 2010 Two-Way Stop-Control Report

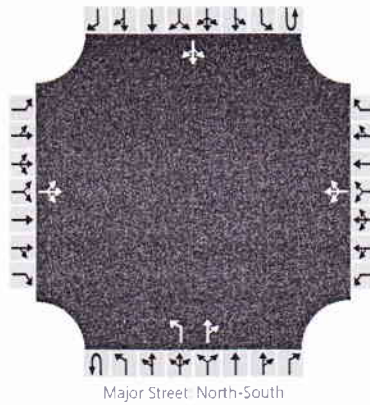
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	PM Base + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	Sr-427 & Stampmill
Jurisdiction	NDOT
East/West Street	Stampmill Drive
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	1	1		0	0	1	
Configuration			LTR				LTR			L		TR			LTR		
Volume, V (veh/h)		3	2	119		10	4	9		207	50	14		10	49	7	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No				No							
Median Type/Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			137				25					230				11	
Capacity, c (veh/h)			942				413					1540				1527	
v/c Ratio			0.15				0.06					0.15				0.01	
95% Queue Length, Q ₉₅ (veh)			0.5				0.2					0.5				0.0	
Control Delay (s/veh)			9.5				14.3					7.7				7.4	
Level of Service, LOS			A				B					A				A	
Approach Delay (s/veh)		9.5				14.3				5.9				1.2			
Approach LOS		A				B											

HCS 2010 Two-Way Stop-Control Report

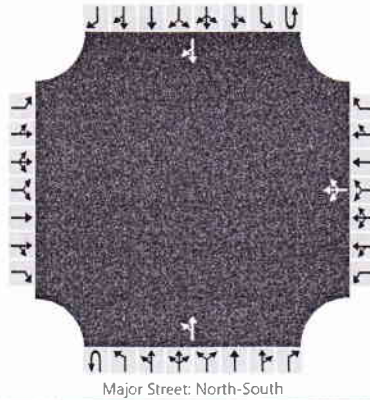
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	AM Existing
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps
Jurisdiction	NDOT
East/West Street	I-80 WB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						3	1	10		5	34				9	40
Percent Heavy Vehicles (%)						2	2	2		2						
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage				Undivided												

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						15				6						
Capacity, c (veh/h)						988				1550						
v/c Ratio						0.02				0.00						
95% Queue Length, Q ₉₅ (veh)						0.0				0.0						
Control Delay (s/veh)						8.7				7.3						
Level of Service, LOS						A				A						
Approach Delay (s/veh)						8.7				1.0						
Approach LOS						A										

HCS 2010 Two-Way Stop-Control Report

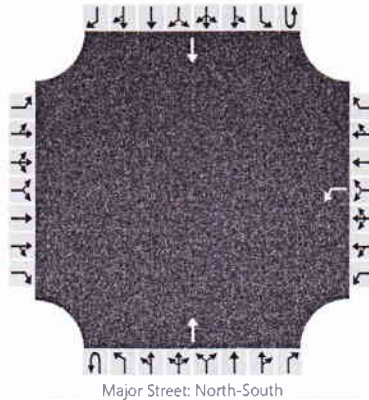
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	AM Existing
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps NB
Jurisdiction	NDOT
East/West Street	NB Left Only
North/South Street	SB Right Only
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0		0	1	0		0	1	0
Configuration						L					T				T	
Volume, V (veh/h)						5					0				40	
Percent Heavy Vehicles (%)						2										
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						6										
Capacity, c (veh/h)						966										
v/c Ratio						0.01										
95% Queue Length, Q ₉₅ (veh)						0.0										
Control Delay (s/veh)						8.7										
Level of Service, LOS						A										
Approach Delay (s/veh)						8.7										
Approach LOS						A										

HCS 2010 Two-Way Stop-Control Report

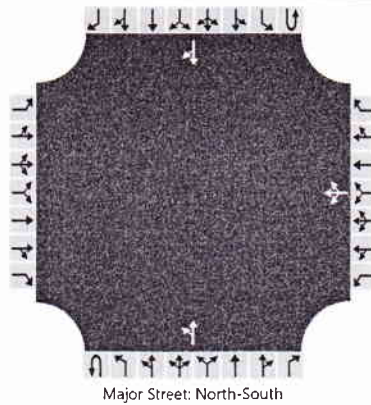
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	PM Existing
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps
Jurisdiction	NDOT
East/West Street	I-80 WB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0	
Configuration							LTR				LT					TR	
Volume, V (veh/h)						3	2	11		2	49					17	34
Percent Heavy Vehicles (%)						2	2	2		2							
Proportion Time Blocked																	
Percent Grade (%)							0										
Right Turn Channelized			No				No				No				No		
Median Type/Storage				Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	

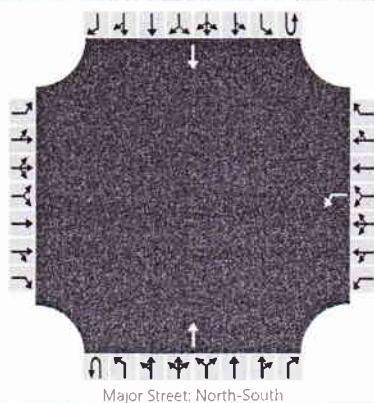
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							17					2					
Capacity, c (veh/h)							957					1546					
v/c Ratio							0.02					0.00					
95% Queue Length, Q ₉₅ (veh)							0.1					0.0					
Control Delay (s/veh)							8.8					7.3					
Level of Service, LOS							A					A					
Approach Delay (s/veh)							8.8					0.3					
Approach LOS							A										

HCS 2010 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	SR-427 & I-80 WB Ramps NB
Agency/Co.	Solaegui Engineers	Jurisdiction	NDOT
Date Performed	2/7/2017	East/West Street	NB Left Only
Analysis Year	2017	North/South Street	SB Right Only
Time Analyzed	PM Existing	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Feather River		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0	0	0	1	0	0	0	1	0
Configuration					L						T				T	
Volume, V (veh/h)					2						0				34	
Percent Heavy Vehicles (%)					2											
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					2											
Capacity, c (veh/h)					974											
v/c Ratio					0.00											
95% Queue Length, Q ₉₅ (veh)					0.0											
Control Delay (s/veh)					8.7											
Level of Service, LOS					A											
Approach Delay (s/veh)					8.7											
Approach LOS					A											

HCS 2010 Two-Way Stop-Control Report

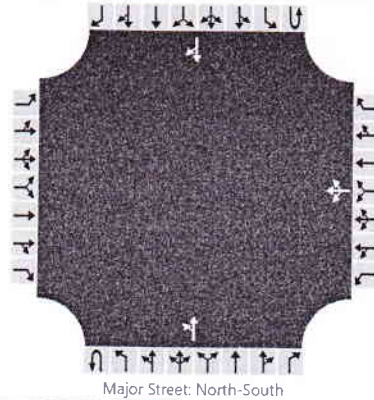
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	AM Existing + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps
Jurisdiction	NDOT
East/West Street	I-80 WB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						3	1	19		5	84				37	188
Percent Heavy Vehicles (%)						2	2	2		2						
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage				Undivided												

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							25			6						
Capacity, c (veh/h)							905			1315						
v/c Ratio							0.03			0.00						
95% Queue Length, Q ₉₅ (veh)							0.1			0.0						
Control Delay (s/veh)							9.1			7.8						
Level of Service, LOS							A			A						
Approach Delay (s/veh)							9.1			0.5						
Approach LOS							A									

HCS 2010 Two-Way Stop-Control Report

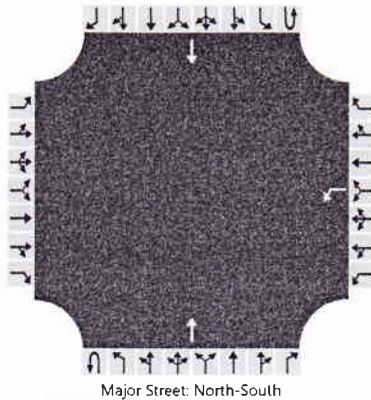
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	AM Existing + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps NB
Jurisdiction	NDOT
East/West Street	NB Left Only
North/South Street	SB Right Only
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0		0	1	0		0	1	0
Configuration						L					T				T	
Volume, V (veh/h)						5					0				188	
Percent Heavy Vehicles (%)						2										
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage				Undivided												

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						6										
Capacity, c (veh/h)						779										
v/c Ratio						0.01										
95% Queue Length, Q ₉₅ (veh)						0.0										
Control Delay (s/veh)						9.7										
Level of Service, LOS						A										
Approach Delay (s/veh)						9.7										
Approach LOS						A										

HCS 2010 Two-Way Stop-Control Report

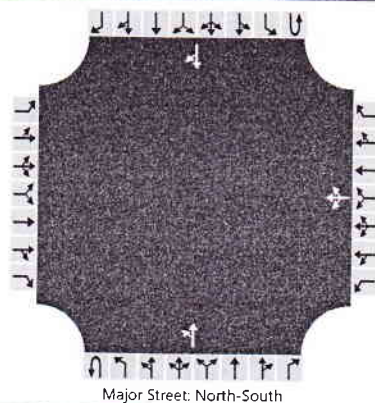
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	PM Existing + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps
Jurisdiction	NDOT
East/West Street	I-80 WB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						3	2	42		2	215					35
Percent Heavy Vehicles (%)						2	2	2		2						
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage																

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							52				2					
Capacity, c (veh/h)							773				1389					
v/c Ratio							0.07				0.00					
95% Queue Length, Q ₉₅ (veh)							0.2				0.0					
Control Delay (s/veh)							10.0				7.6					
Level of Service, LOS							A				A					
Approach Delay (s/veh)							10.0				0.1					
Approach LOS							A									

HCS 2010 Two-Way Stop-Control Report

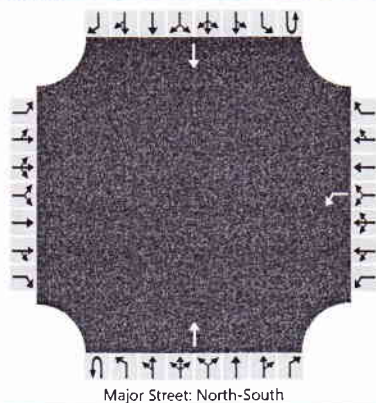
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	PM Existing + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps NB
Jurisdiction	NDOT
East/West Street	NB Left Only
North/South Street	SB Right Only
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0	0	0	1	0	0	0	1	0
Configuration						L					T				T	
Volume, V (veh/h)						2					0				131	
Percent Heavy Vehicles (%)						2										
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						2										
Capacity, c (veh/h)						846										
v/c Ratio						0.00										
95% Queue Length, Q ₉₅ (veh)						0.0										
Control Delay (s/veh)						9.3										
Level of Service, LOS						A										
Approach Delay (s/veh)						9.3										
Approach LOS						A										

HCS 2010 Two-Way Stop-Control Report

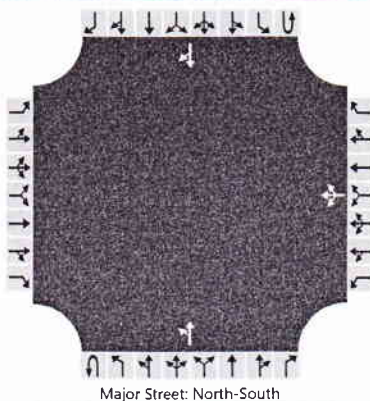
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	AM Base
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps
Jurisdiction	NDOT
East/West Street	I-80 WB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						4	1	12		6	42				11	50
Percent Heavy Vehicles (%)						2	2	2		2						
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						18				7						
Capacity, c (veh/h)						973				1532						
v/c Ratio						0.02				0.00						
95% Queue Length, Q ₉₅ (veh)						0.1				0.0						
Control Delay (s/veh)						8.8				7.4						
Level of Service, LOS						A				A						
Approach Delay (s/veh)					8.8				1.0							
Approach LOS					A											

HCS 2010 Two-Way Stop-Control Report

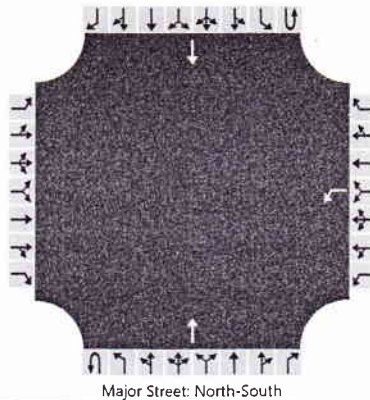
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	AM Base
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps NB
Jurisdiction	NDOT
East/West Street	NB Left Only
North/South Street	SB Right Only
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0	0	0	1	0	0	0	1	0
Configuration						L					T				T	
Volume, V (veh/h)						6					0				50	
Percent Heavy Vehicles (%)						2										
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						7										
Capacity, c (veh/h)						951										
v/c Ratio						0.01										
95% Queue Length, Q ₉₅ (veh)						0.0										
Control Delay (s/veh)						8.8										
Level of Service, LOS						A										
Approach Delay (s/veh)						8.8										
Approach LOS						A										

HCS 2010 Two-Way Stop-Control Report

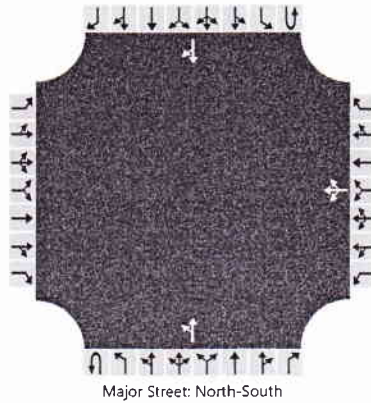
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	PM Base
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps
Jurisdiction	NDOT
East/West Street	I-80 WB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0	
Configuration							LTR				LT					TR	
Volume, V (veh/h)						4	3	14		3	60					21	42
Percent Heavy Vehicles (%)						2	2	2		2							
Proportion Time Blocked																	
Percent Grade (%)							0										
Right Turn Channelized		No				No				No				No			
Median Type/Storage				Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							23				3						
Capacity, c (veh/h)							933				1529						
v/c Ratio							0.02				0.00						
95% Queue Length, Q ₉₅ (veh)							0.1				0.0						
Control Delay (s/veh)							9.0				7.4						
Level of Service, LOS							A				A						
Approach Delay (s/veh)							9.0				0.3						
Approach LOS							A										

HCS 2010 Two-Way Stop-Control Report

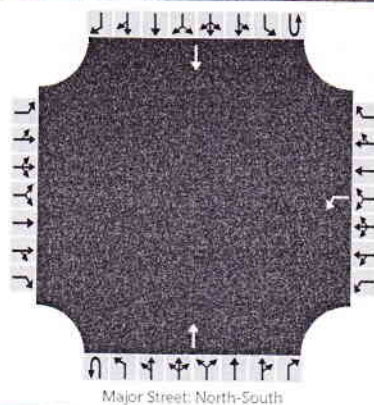
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	PM Base
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps NB
Jurisdiction	NDOT
East/West Street	NB Left Only
North/South Street	SB Right Only
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0	0	0	1	0	0	0	1	0
Configuration						L					T				T	
Volume, V (veh/h)						3					0				42	
Percent Heavy Vehicles (%)						2										
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage				Undivided												

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						3										
Capacity, c (veh/h)						962										
v/c Ratio						0.00										
95% Queue Length, Q ₉₅ (veh)						0.0										
Control Delay (s/veh)						8.8										
Level of Service, LOS						A										
Approach Delay (s/veh)						8.8										
Approach LOS						A										

HCS 2010 Two-Way Stop-Control Report

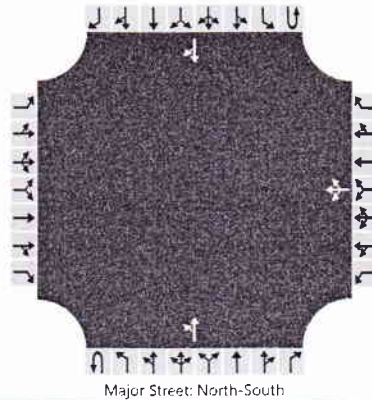
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps
Jurisdiction	NDOT
East/West Street	I-80 WB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						4	1	21		6	92				39	198
Percent Heavy Vehicles (%)						2	2	2		2						
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage				Undivided												

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						28				7						
Capacity, c (veh/h)						888				1300						
v/c Ratio						0.03				0.01						
95% Queue Length, Q ₉₅ (veh)						0.1				0.0						
Control Delay (s/veh)						9.2				7.8						
Level of Service, LOS						A				A						
Approach Delay (s/veh)						9.2				0.5						
Approach LOS						A										

HCS 2010 Two-Way Stop-Control Report

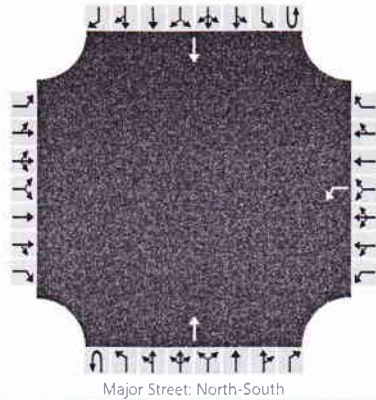
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps NB
Jurisdiction	NDOT
East/West Street	NB Left Only
North/South Street	SB Right Only
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0	0	0	1	0	0	0	1	0
Configuration						L					T				T	
Volume, V (veh/h)						6					0				198	
Percent Heavy Vehicles (%)						2										
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						7										
Capacity, c (veh/h)						768										
v/c Ratio						0.01										
95% Queue Length, Q ₉₅ (veh)						0.0										
Control Delay (s/veh)						9.7										
Level of Service, LOS						A										
Approach Delay (s/veh)						9.7										
Approach LOS						A										

HCS 2010 Two-Way Stop-Control Report

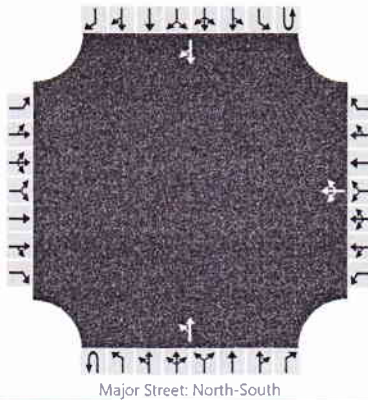
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	PM Base + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps
Jurisdiction	NDOT
East/West Street	I-80 WB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						4	3	45		3	226					39
Percent Heavy Vehicles (%)						2	2	2		2						
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage				Undivided												

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							57				3					
Capacity, c (veh/h)							751				1375					
v/c Ratio							0.08				0.00					
95% Queue Length, Q ₉₅ (veh)							0.2				0.0					
Control Delay (s/veh)							10.2				7.6					
Level of Service, LOS							B				A					
Approach Delay (s/veh)							10.2				0.1					
Approach LOS							B									

HCS 2010 Two-Way Stop-Control Report

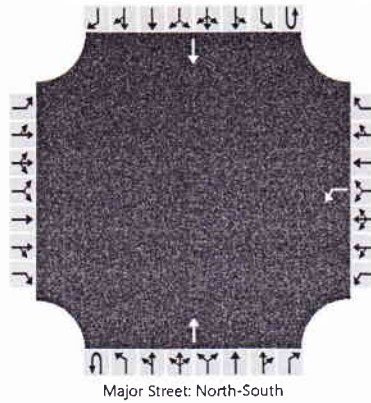
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	PM Base + Project
Intersection Orientation	North-South
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 WB Ramps NB
Jurisdiction	NDOT
East/West Street	NB Left Only
North/South Street	SB Right Only
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0	0	0	1	0	0	0	1	0
Configuration						L					T				T	
Volume, V (veh/h)						3					0				139	
Percent Heavy Vehicles (%)						2										
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage				Undivided												

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						3										
Capacity, c (veh/h)						837										
v/c Ratio						0.00										
95% Queue Length, Q ₉₅ (veh)						0.0										
Control Delay (s/veh)						9.3										
Level of Service, LOS						A										
Approach Delay (s/veh)						9.3										
Approach LOS						A										

HCS 2010 All-Way Stop-Control Summary Report

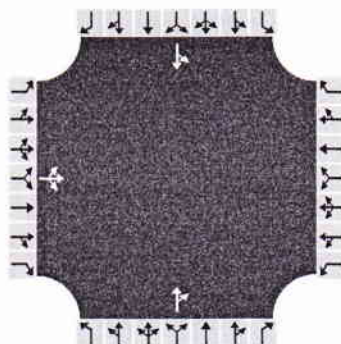
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	0.25
Analyis Time Period (hrs)	AM Existing
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 EB Ramps
Jurisdiction	NDOT
East/West Street	I-80 EB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume	34	2	1					5	2	10	2	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR						TR			LT		
Flow Rate, v (veh/h)	41						8			13		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

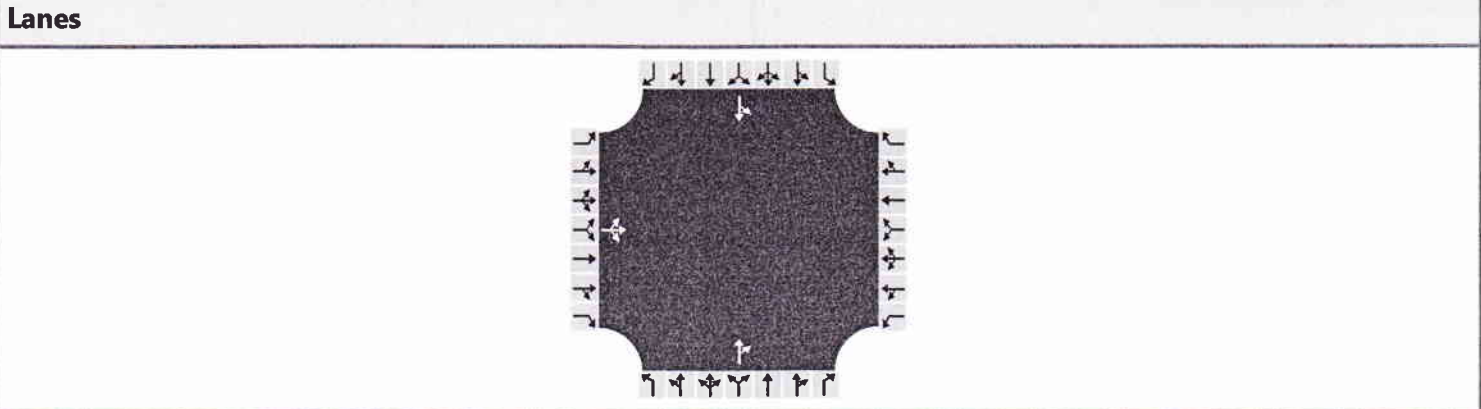
Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.037						0.007			0.012		
Final Departure Headway, hd (s)	4.15						3.87			4.20		
Final Degree of Utilization, x	0.047						0.008			0.016		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	2.15						1.87			2.20		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	41						8			13		
Capacity	868						931			857		
95% Queue Length, Q ₉₅ (veh)	0.1						0.0			0.0		
Control Delay (s/veh)	7.4						6.9			7.3		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh)	7.4						6.9			7.3		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCS 2010 All-Way Stop-Control Summary Report

General Information		Site Information	
Analyst	MSH	Intersection	SR-427 & I-80 EB Ramps
Agency/Co.	Solaegui Engineers	Jurisdiction	NDOT
Date Performed	2/7/2017	East/West Street	I-80 EB Ramps
Analysis Year	2017	North/South Street	SR-427
Time Analyzed	0.25	Peak Hour Factor	0.90
Anaylsis Time Period (hrs)	PM Existing		
Project Description	Feather River		



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume	47	2	3					4	2	17	3	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR						TR			LT		
Flow Rate, v (veh/h)	58						7			22		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.051						0.006			0.020		
Final Departure Headway, hd (s)	4.14						3.89			4.24		
Final Degree of Utilization, x	0.067						0.007			0.026		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	2.14						1.89			2.24		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	58						7			22		
Capacity	869						926			849		
95% Queue Length, Q ₉₅ (veh)	0.2						0.0			0.1		
Control Delay (s/veh)	7.4						6.9			7.4		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh)	7.4						6.9			7.4		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	7.4						A					

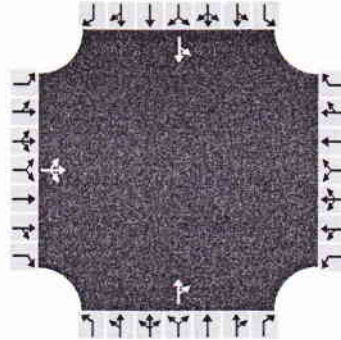
HCS 2010 All-Way Stop-Control Summary Report

General Information

Site Information

Analyst	MSH	Intersection	SR-427 & I-80 EB Ramps
Agency/Co.	Solaegui Engineers	Jurisdiction	NDOT
Date Performed	2/7/2017	East/West Street	I-80 EB Ramps
Analysis Year	2017	North/South Street	SR-427
Time Analyzed	0.25	Peak Hour Factor	0.90
Anaylsis Time Period (hrs)	AM Existing + Project		
Project Description	Feather River		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume	84	2	1					5	2	38	2	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR						TR			LT		
Flow Rate, v (veh/h)	97						8			44		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.086						0.007			0.040		
Final Departure Headway, hd (s)	4.24						4.03			4.35		
Final Degree of Utilization, x	0.114						0.009			0.054		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	2.24						2.03			2.35		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	97						8			44		
Capacity	849						893			827		
95% Queue Length, Q ₉₅ (veh)	0.4						0.0			0.2		
Control Delay (s/veh)	7.8						7.1			7.6		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh)	7.8						7.1			7.6		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	7.7						A					

HCS 2010 All-Way Stop-Control Summary Report

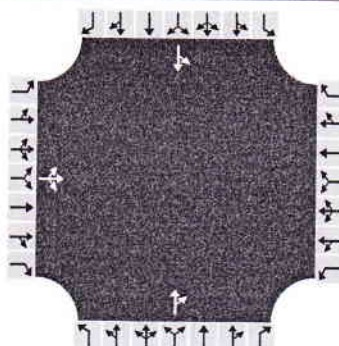
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2017
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Existing + Project
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 EB Ramps
Jurisdiction	NDOT
East/West Street	I-80 EB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume	213	2	3					4	2	35	3	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR						TR			LT		
Flow Rate, v (veh/h)	242						7			42		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.215						0.006			0.038		
Final Departure Headway, hd (s)	4.24						4.34			4.68		
Final Degree of Utilization, x	0.285						0.008			0.055		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	2.24						2.34			2.68		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	242						7			42		
Capacity	849						829			769		
95% Queue Length, Q ₉₅ (veh)	1.2						0.0			0.2		
Control Delay (s/veh)	8.9						7.4			8.0		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh)	8.9						7.4			8.0		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	8.8						A					

HCS 2010 All-Way Stop-Control Summary Report

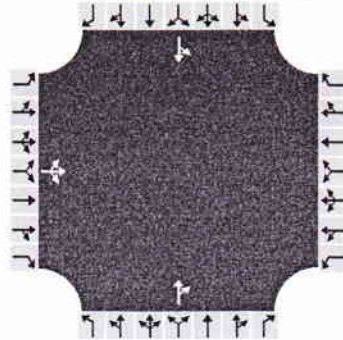
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	0.25
Anaylsis Time Period (hrs)	AM Base
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 EB Ramps
Jurisdiction	NDOT
East/West Street	I-80 EB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume	42	3	1					6	3	12	3	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR						TR			LT		
Flow Rate, v (veh/h)	51						10			17		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.045						0.009			0.015		
Final Departure Headway, hd (s)	4.16						3.87			4.22		
Final Degree of Utilization, x	0.059						0.011			0.020		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	2.16						1.87			2.22		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	51						10			17		
Capacity	865						931			853		
95% Queue Length, Q ₉₅ (veh)	0.2						0.0			0.1		
Control Delay (s/veh)	7.4						6.9			7.3		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh)	7.4						6.9			7.3		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCS 2010 All-Way Stop-Control Summary Report

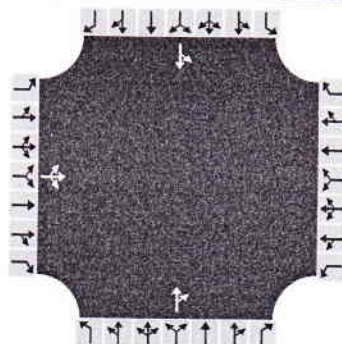
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	0.25
Anaylsis Time Period (hrs)	PM Base
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 EB Ramps
Jurisdiction	NDOT
East/West Street	I-80 EB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume	57	3	4					6	3	21	4	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR						TR			LT		
Flow Rate, v (veh/h)	71						10			28		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.063						0.009			0.025		
Final Departure Headway, hd (s)	4.16						3.92			4.27		
Final Degree of Utilization, x	0.082						0.011			0.033		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	2.16						1.92			2.27		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	71						10			28		
Capacity	866						918			843		
95% Queue Length, Q ₉₅ (veh)	0.3						0.0			0.1		
Control Delay (s/veh)	7.5						7.0			7.4		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh)	7.5						7.0			7.4		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	7.4						A					

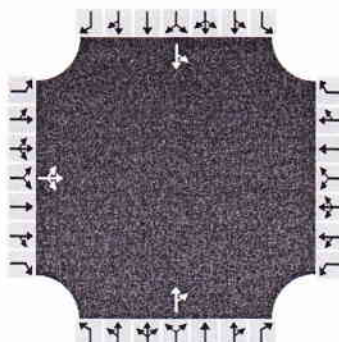
HCS 2010 All-Way Stop-Control Summary Report

General Information

Site Information

Analyst	MSH	Intersection	SR-427 & I-80 EB Ramps
Agency/Co.	Solaegui Engineers	Jurisdiction	NDOT
Date Performed	2/7/2017	East/West Street	I-80 EB Ramps
Analysis Year	2027	North/South Street	SR-427
Time Analyzed	0.25	Peak Hour Factor	0.90
Analysis Time Period (hrs)	AM Base + Project		
Project Description	Feather River		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume	92	3	1					6	3	40	3	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR						TR			LT		
Flow Rate, v (veh/h)	107						10			48		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20				3.20	
Initial Degree of Utilization, x	0.095						0.009				0.042	
Final Departure Headway, hd (s)	4.25						4.03				4.38	
Final Degree of Utilization, x	0.126						0.011				0.058	
Move-Up Time, m (s)	2.0						2.0				2.0	
Service Time, ts (s)	2.25						2.03				2.38	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	107						10				48	
Capacity	847						893				823	
95% Queue Length, Q_{95} (veh)	0.4						0.0				0.2	
Control Delay (s/veh)	7.9						7.1				7.6	
Level of Service, LOS	A						A				A	
Approach Delay (s/veh)	7.9						7.1			7.6		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	7.8						A					

HCS 2010 All-Way Stop-Control Summary Report

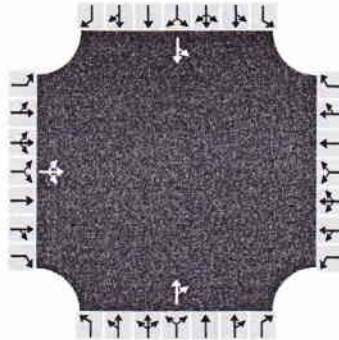
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	2/7/2017
Analysis Year	2027
Time Analyzed	0.25
Anaylsis Time Period (hrs)	PM Base + Project
Project Description	Feather River

Site Information

Intersection	SR-427 & I-80 EB Ramps
Jurisdiction	NDOT
East/West Street	I-80 EB Ramps
North/South Street	SR-427
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

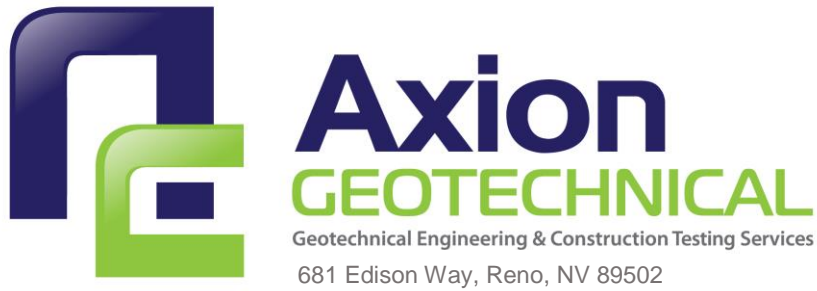
Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume	223	3	4					6	3	39	4	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR						TR			LT		
Flow Rate, v (veh/h)	256						10			48		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.227						0.009			0.042		
Final Departure Headway, hd (s)	4.26						4.38			4.72		
Final Degree of Utilization, x	0.302						0.012			0.063		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	2.26						2.38			2.72		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	256						10			48		
Capacity	845						822			763		
95% Queue Length, Q ₉₅ (veh)	1.3						0.0			0.2		
Control Delay (s/veh)	9.1						7.4			8.0		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh)	9.1						7.4			8.0		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	8.9						A					



GEOTECHNICAL FEASIBILITY STUDY

PROPOSED

FEATHER RIVER RESIDENTIAL DEVELOPMENT

Assessor's Office Parcel Number 084-291-38

Wadsworth Area

WASHOE COUNTY, NEVADA

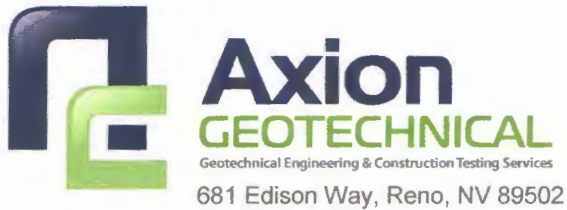
Prepared for:

Agua Fria Insurance Services, LLC
3509 E. Harmon Avenue
Las Vegas, Nevada 89121

Attention: Charlie McDonnell

February 14, 2017

Project No. 17.148.01-G



February 14, 2017
Project No. 17.148.01-G

Agua Fria Insurance Services, LLC
3509 E. Harmon Avenue
Las Vegas, Nevada 89121

Attn: Charlie McDonnell

Re: Geotechnical Feasibility Study, Proposed Feather River Residential Development
APN 084-291-38, Wadsworth Area of Washoe County, Nevada

Dear Mr. McDonnell:

Axion Geotechnical is pleased to present results of a geotechnical feasibility study our firm conducted at the property. Based on results of our study, experience in the area, and understanding of proposed development, we conclude that, from a preliminary geotechnical standpoint, the property is suitable for single-family residential development. The primary potential geotechnical concerns are the **clean nature** of the underlying sandy soils, and the presence of **shallow ground water, clay, and oversize aggregate and bedrock**.

We appreciate having been selected to prepare this study and trust results fulfill your needs. If you or your design consultants have questions, please do not hesitate to contact us at (775) 771-2388 or chris@axionengineering.net.

Respectfully,

AXION GEOTECHNICAL, LLC

Chris D. Betts

Chris D. Betts, P.E.
President



TABLE OF CONTENTS

I INTRODUCTION.....	1
II SITE AND SOIL CONDITIONS	2
III GEOLOGIC AND SEISMIC CONSIDERATIONS	5
A. Geology and Faulting.....	5
B. Liquefaction	5
C. Slope Stability.....	5
D. Radon	6
E. Flooding.....	6
IV OPINIONS AND DISCUSSIONS	6
V REFERENCES	9
VI DISTRIBUTION.....	10

I INTRODUCTION

Axion Geotechnical is pleased to present results of a geotechnical feasibility study our firm conducted for the proposed Feather River Residential Development. The 108.41-acre parcel is Assessor's Office Parcel Number 084-291-38, and is in the Wadsworth area of Washoe County, Nevada (Property). Based on a site plan by TEC Civil Engineering Consultants dated February 1, 2017, we understand development includes construction of 324 individual lots for single-family residences serviced by community water and sewer systems with on-site storm water retention. The structures will have one to two levels, will be wood-framed, and supported with shallow conventional spread foundations. Dedicated service street will be surfaced with asphaltic concrete.

We have not received information concerning anticipated foundation loads; however, we anticipate maximum wall loads will be on the order of one kip per foot (dead plus live plus snow load), and that maximum column loads will be less than five kips (dead plus live plus snow load). For frost protection, perimeter foundations will bottom at least 24 inches below lowest adjacent exterior ground surface. Structural design will follow criteria outlined in the 2012 *International Residential Code*.

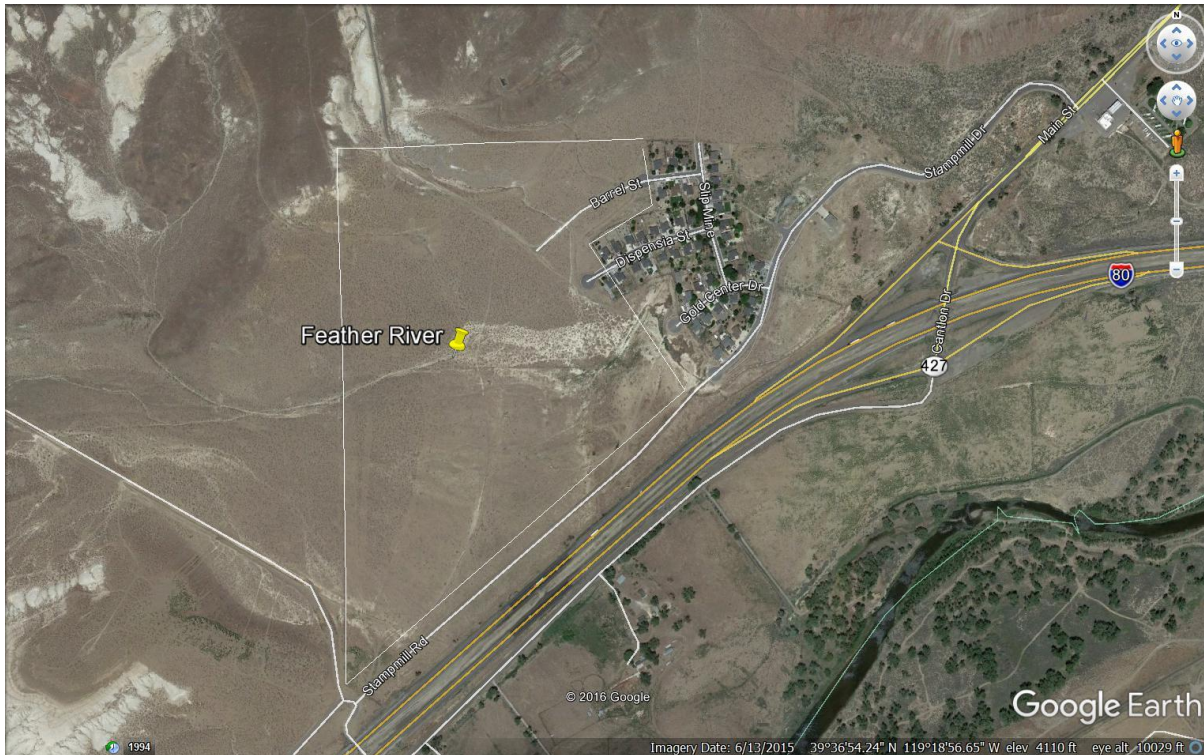
We have not received civil design plans; however, we anticipate that earthwork to attain proposed grades and for proper site drainage will result in cuts and fills to about 10 feet. New slopes will be constructed at final inclinations of two horizontal to one vertical (2H:1V) or flatter. Site retaining walls are anticipated. Depth of utility trenches should be less than eight feet. We assume underground utilities in proposed structural areas will be abandoned or relocated. Earthwork will be performed in accordance with the 2012 *International Building Code*, and the 2016 *Standard Specifications for Public Works Construction* (Regional Transportation Commission).

The purpose of our work was to perform a site reconnaissance and review available literature and maps to provide opinions and discussions concerning the geotechnical suitability of the Property for its intended use. Once design parameters, such as building locations, finish floor elevations, foundation loads and proposed grading are known; a design-level geotechnical investigation report with detailed information of the subsurface soil conditions and recommendations for design and construction must be performed.

This report is preliminary and geotechnical in nature and not intended to identify other potential site constraints such as environmental hazards, wetlands determinations or the potential presence of buried utilities. Opinions and discussions included in this report are specific to development at the Property and are not intended for off-site development.

II SITE AND SOIL CONDITIONS

The Property is undeveloped and vacant. Review of images available on Google Earth reveals the Property has been undeveloped and vacant dating back to 1994, the oldest image available. The Property is bordered undeveloped land to the north, south and west, and single-family residences to the east. Unimproved Stampmill Road borders the southern property line. The Property is relatively level with a gentle to somewhat moderate grade downward from the NW to the SE, matches elevations of adjacent development, and is covered by medium dense to dense sagebrush and weeds. Two natural drainages cross the Property in a West, NW to SE direction. Jeep trails and wire fences cross the Property. Underground utility markers cross the SW corner of the Property.



Google Earth Image of Property



View of Property from SW to NE

Based on the United States Geological Survey 7.5-Minute topographic map of the Fernley West Quadrangle, the site is in Section 8, Township 20 North, Range 24 East, and elevation is between 4,100 and 4,200 feet relative to mean sea level.

According to the U.S. Department of Agriculture Natural Resources Conservation Service *Web Soil Survey*, the underlying earth materials consist of predominantly of Hawsley loam sand, 2 to 8 percent slopes (map unit #7013) and minor amounts of Sagouspe loamy sand, 0 to 1 percent slopes (map unit #196) and the Pirouette-Theon-Weena association (map unit #7004). These map units are described as follows:

Sagouspe loamy sand, 0 to 1 percent slopes (map unit #196): This unit is located near the SE corner of the Property. Elevation is 3,890 to 4,150 feet. Landform is stream terraces. Parent material is alluvium derived from mixed sources. A typical soil profile includes 0 to 43 inches of loam sand, underlain to 58 inches by stratified coarse sand to silt loam. Depth to restrictive feature is more than 80 inches. Natural drainage class is somewhat poorly drained. Runoff class is negligible. Depth to water table is about 36 to 60 inches. Frequency of flooding is none. Frequency of ponding is none. Corrosion to steel is high. Corrosion to concrete is low.

Pirouette-Theon-Weena association (map unit #7004): This unit is located near the NW corner of the Property. Elevation is 3,950 to 5,330 feet. The map composition includes 35 percent Pirouette and similar soils; 30 percent Theon and similar soils; 20 percent Weena and similar soils; and 15 percent minor components. Corrosion to steel is moderate. Corrosion to concrete is moderate. These units are described as follows:

Pirouette: Landform is hills. Parent material is colluvium and/or residuum. A typical soil profile includes 0 to 3 inches of very cobbly very fine sandy loam, 3 to 10 inches of very cobbly clay loam, 10 to 19 inches of extremely cobbly sandy loam, 19 to 20 inches is cemented material, and 20 to 30 inches is bedrock. Slope is 8 to 30 percent. Depth to restrictive feature is 11 to 20 inches to duripan, and 12 to 23 inches to lithic bedrock. Natural drainage class is well-drained. Runoff class is very high. Depth to water table is more than 80 inches. Frequency of flooding in none. Frequency of ponding is none.

Theon: Landform is hills. Parent material is colluvium and/or residuum weathered from volcanic rock. A typical soil profile includes 0 to 2 inches of very gravelly sandy loam, 2 to 11 inches of very gravelly clay loam, and 11 to 21 inches is bedrock. Slope is 15 to 50 percent. Depth to restrictive feature is 8 to 14 inches to lithic bedrock. Natural drainage class is well-drained. Runoff class is very high. Depth to water table is more than 80 inches. Frequency of flooding in none. Frequency of ponding is none.

Weena: Landform is hills. Parent material is residuum. A typical soil profile includes 0 to 2 inches of loam, 2 to 7 inches of extremely paragravelly loam, and 7 to 60 inches is bedrock. Slope is 15 to 50 percent. Depth to restrictive feature is 4 to 14 inches to paralithic bedrock. Natural drainage class is well-drained. Runoff class is very high. Depth to water table is more than 80 inches. Frequency of flooding in none. Frequency of ponding is none.

Hawsley loamy sand, 2 to 8 percent slopes (map unit #7013): This unit is located near the SE corner of the Property. Elevation is 3,940 to 4,590 feet. Landform is sand sheets. Parent material is sandy eolian sands derived from mixed sources over sandy alluvium derived from mixed sources. A typical soil profile includes 0 to 62 inches of sand. Depth to restrictive feature is more than 80 inches. Natural drainage class is somewhat excessively drained. Runoff class is very low. Depth to water table is more than 80 inches. Frequency of flooding in none. Frequency of ponding is none. Corrosion to steel is moderate. Corrosion to concrete is low.

Based on geologic mapping by H. F. Bonham (*Geology and Mineral Deposits of Washoe and Storey Counties, Nevada*, Nevada Bureau of Mines and Geology, Bulletin 70, dated 1969), the materials underlying the site consist of Quaternary-age lake deposits, clay, silt, sand, gravel and calcareous tufa (QI). It includes some areas thinly veneered by eolian sand, chiefly of Pleistocene-age. The Tertiary-age Pyramid Sequence (Tsv) is mapped along the north and consist of sequence includes basalt, andesite, and dacite flows, flow breccias, mudflow breccias, conglomerates, tuffs and associated intrusives. The sequence is intercalated with lenses of silicic waterlain tuff, diatomite, shale and sandstone.

III GEOLOGIC AND SEISMIC CONSIDERATIONS

To evaluate potential geological hazards at the Property, our study included a site reconnaissance and review of available literature and maps.

A. Geology and Faulting

The geologic structure of the area is characterized by high angle extensional normal faults trending in a north-northeast direction. The basin is a down dropped graben with neighboring horsts to the east and west. The present topography of the basin is due primarily to a combination of extensional normal faulting and Quaternary-age basinal sedimentation.

Based on referenced geologic map, no faults cross the Property. According to *Quaternary Faults in Google Earth* by the USGS, no faults cross the Property. Quaternary-age faults are those which have experienced movement in the last 1.6 million years. The website indicates that the nearest Holocene- to latest-Pleistocene-age fault is approximately one mile northeast of the Property. Faults of this age have moved or shifted in the last 15,000 years.

Based on the Nevada Seismological Laboratory website the nearest principal Quaternary-age faults are the Pyramid Lake fault zone and the Olinghouse fault zone. The Nevada Seismological Laboratory indicates earthquakes of magnitude 6.8 and 7.1 are possible along these fault zones (*Reno/Carson Fault Information*, updated January 31, 2003).

B. Liquefaction

Liquefaction is a loss of soil shear strength associated with loose saturated granular soils subjected to strong earthquake shaking. Liquefaction can result in unacceptable movement of foundations supported by such soils. A detailed assessment of liquefaction potential was not part of the scope of our work; however, due to the mountainous nature of the area we do not believe the Property is susceptible to liquefaction.

C. Slope Stability

Based on the relatively level nature of the site and our anticipation that slopes will be shallow and constructed at final inclinations of two horizontal to one vertical (2H:1V) or flatter, and that site earth retaining walls are proposed, we do not believe rock falls or landslides will impact the Property.

D. Radon

Radon, a colorless, odorless, radioactive gas derived from the natural decay of uranium, is found in nearly all rocks and soils. The Environmental Protection Agency (EPA) suggests that remedial action be taken to reduce radon in any structure with average indoor radon of 4.0 picocuries per liter (pCi/L) or more. Based on *Radon in Nevada* (Rigby *et al.*, Nevada Bureau of Mines and Geology, Bulletin 108, 1994), the Property is in an area with an average indoor measurement equal to or greater than 2.0 pCi/L and less than 4.0 pCi/L.

E. Flooding

The Federal Emergency Management Agency flood map (FEMA-Map 32031C3127G, revise date of March 16, 2009) shows the Property in Flood Hazard Zones X unshaded. According to FEMA, these are areas determined to be outside the 0.2% annual chance floodplain.

IV OPINIONS AND DISCUSSIONS

Based on results of our study, experience in the area, and understanding of proposed development, we conclude that, from a preliminary geotechnical standpoint, the Property is suitable for residential development. The primary potential geotechnical concerns are the **clean nature** of the underlying sandy soils, and the presence of **shallow ground water**, **clay**, and **oversize aggregate** and **bedrock**.

The soil survey and geologic map indicates the Property is underlain primarily by sandy soil. Sandy soil can by relatively contain and contain little or no binder such as silt or fine sand. Consideration should be given to the increased difficulty associated with moisture conditioning and attaining specified compaction associated with clean soils. Consideration should also be given to the potential for instability of excavation sidewalls and the subsequent lateral increase in pit dimensions and trench widths due to widening or over-break. We anticipate stabilization measures such reducing slope excavation inclination or installing shoring may be necessary to maintain stability and to ensure safety.

The soil survey indicates that shallow ground water may be present near the SE portion of the property (map unit 196). Consideration should be given to deep over-excavations or trenches which may approach ground water elevations or areas of high moisture content, such as the zone within 36 inches above ground water, and stabilization measures which may be necessary to achieve recommended compaction. Mobility and use of vibratory or rubber tire equipment may be restricted in these areas. Depending upon the degree of saturation, the site may require stabilization such as the use of oversize aggregate (i.e. angular cobbles) or geotextile fabric, and drainage measures such as up-gradient French drains may be necessary.

Over-break of trench sidewalls may occur and stabilization and dewatering may be needed to facilitate construction. Consideration should also be given to time constraints associated with drying of trench backfill prior to its reuse. Where the presence of ground water restricts compaction effort, free draining, crushed clean gravel and filter fabric may be necessary for reuse as backfill and, with the Manufacturer's approval, pipe bedding. As the presence of long-term moisture can create detrimental conditions, foundation drain systems should be considered to prevent the accumulation of water against foundations, grade beams or in crawlspaces. Waterproofing and protection of slabs-on-grade where moisture sensitive floor coverings are utilized should be considered.

Mapping indicates that clay soil is present. Expansive soils are subject to substantial volume changes (shrink and swell) with changes in moisture content. Changes in moisture content can occur due to seasonal variations in precipitation, landscape irrigation, broken or leaking water pipes and sewer lines, and/or poor site drainage. These volume changes can cause differential movements (settlement or heave) of foundations, exterior flatwork such as walkways, stoops and patios, and pavement sections.

One method to reduce the potential for movement is to remove (over-excavate) the expansive material to a sufficient depth and replace it with approved compacted fill, thereby reducing the thickness of the expansive layer, providing surcharge, and maintaining moisture at a suitable and near constant level. In conjunction with over-excavation and filling, moisture conditioning of the exposed materials to a slightly over optimum moisture content will be needed during construction.

Studies and experience have shown that movement of components can be expected, even if the recommended removal depth is followed, whenever underlying expansive soil is allowed to remain. Therefore, the intent of overexcavation recommendations is to control this movement without exceeding economic feasibility; however, the Owner or Developer should weigh benefits of deeper removal.

In addition to their expansive characteristics, clay soils also exhibit a lower Resistance Value and Modulus of Subgrade Reaction (k) than granular material. To reduce the thickness of aggregate base and to minimize future maintenance in exterior flatwork and pavement areas, portions of these soils should be removed and replaced with approved compacted fill subbase.

As clay soil also inhibits achieving uniform moisture content and impedes compaction efforts, consideration should be given to time constraints associated with scarification, moisture conditioning, drying and compacting clay soils. During periods of inclement weather, water may also become perched above the clay soil, resulting in a saturated condition for prolonged periods and creating additional limitations on equipment mobility. Consideration should be given to maintaining moisture content to prevent wind erosion and for controlling dust during earthwork operations.

Mapping indicates oversize aggregate and shallow bedrock may be present across the site. Consideration should be given to the difficulty of grading and trenching associated with these materials. Blasting or use of special equipment such as a hydraulic rock hammer may be necessary.

In addition to potential difficulty of earthwork operations, consideration should be given to the possibility that oversize aggregate, gravel, cobbles and possibly boulders, will be generated during earthwork operations. Consideration should be given to the subsequent reduction of the quantity of material available for use as fill, and that oversize aggregate could require off-hauling or that import material could be required to balance earthwork quantities or to attain proposed grades. If oversize aggregate is proposed for use as fill, screening will be required and sufficiently large equipment will be necessary to properly place and compact rock fills. Compaction approval during the placement of rock fills can only be achieved based on visual performance specifications established by the Geotechnical Engineer, which would increase on-site technician time and thus, in turn, increase the cost of inspection services. The removal of large cobbles or boulders will result in undercutting of excavation sidewalls and the resulting trench widths would be increased. The presence of resistant bedrock could protrude into foundation areas, thereby requiring the drilling and epoxy of reinforcing steel. Footings may need to be formed and stepped.

The soil survey suggests the native soils may exhibit a corrosion potential to steel and concrete. Based on the reported values, we believe that adequate corrosion mitigation can be achieved by using properly prepared and placed Type II portland cement concrete, by maintaining a minimum (3-inch) concrete cover where reinforcing steel or other metal is in close proximity to on-site soils and, at the direction of the Manufacturer, by using special coating on reinforcing steel and metal.

As moderate vegetation is present across the Property, consideration should be given to the increased construction costs associated with clearing, stripping and removal of these materials.

As previously mentioned, underground utility markers cross the SW corner of the Property. Consideration should be given to the possibility that easements exist and that underground utilities may require relocation in structural areas. Consideration should also be given to the possibility that construction set-backs are required, and the subsequent reduction of property available for development.

V REFERENCES

American Concrete Institute, *Building Code Requirements for Reinforced Concrete* (ACI 318-11), dated 2012.

Bonham, H. F. *Geology and Mineral Deposits of Washoe and Storey Counties, Nevada*. Reno: Nevada Bureau of Mines & Geology, Bulletin 70, University of Nevada, Reno, 1969.

Federal Emergency Management Agency, U.S. Department of Homeland Security, *FEMA's Flood Map Service Center* (<https://msc.fema.gov/portal>).

International Code Council *2012 International Residential and Building Codes*, Whittier: International Code Council, Inc., 2012.

Lieberman, P. *Accelerated Corrosion Tests for Buried Metal Structures*. Pipeline and Gas Journal, October, 1996.

Regional Transportation Commission of Washoe County. *Standard Specification for Public Works Construction*. Reno: Regional Transportation Commission of Washoe County, 2016.

Rigby, James G., Jonathan G. Price, Lindsay G. Christensen, Daphne D. La Pointe, Alan R. Ramelli, Mario O. Desilets, Ronald H. Hess, and Stanley R. Marshall. *Radon in Nevada*. Reno: Nevada Bureau of Mines & Geology, Bulletin 108, University of Nevada, Reno, 1994.

United States Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey.

United States Department of the Interior Geological Survey. *Fernley West Quadrangle*. 7.5-minute series map (topographic). 1:24,000. Denver: USGS. 1985.

Agua Fria Insurance Services, LLC
Geotechnical Feasibility Study - Project No. 17.148.01-G
Proposed Feather River Residential Development
APN 084-291-38 – Wadsworth Area of Washoe County, Nevada
February 14, 2017

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

VI DISTRIBUTION

Unbound original and one .pdf to:

Agua Fria Insurance Services, LLC
3509 E. Harmon Avenue
Las Vegas, Nevada 89121
Attention: Charlie McDonnell

One unbound wet-stamped copy and one .pdf to:

TEC Civil Engineering Consultants
9437 Double Diamond Parkway, Suite 17
Reno, Nevada 89521
Attention: J. R. Hildebrand, Owner
Telephone: (775) 352-7800
Facsimile: (775) 352-7929

PRELIMINARY SANITARY SEWER REPORT

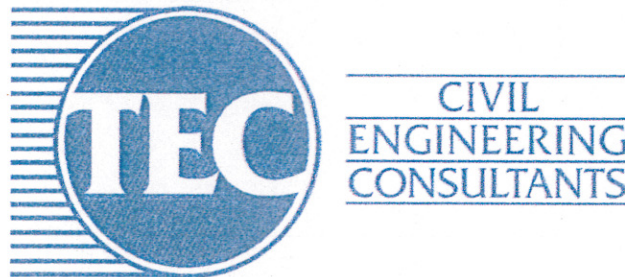
FOR

**FEATHER RIVER
TENTATIVE SUBDIVISION MAP
325-LOT SINGLE FAMILY RESIDENTIAL DEVELOPMENT**

PREPARED FOR:

**Agua Fria Insurance Services, LLC
3509 East Harmon Ave
Las Vegas, NEVADA 89121**

PREPARED BY:



**9480 DOUBLE DIAMOND PARKWAY, SUITE 200
RENO, NEVADA 89512**



**JOB #: AguaFria.001
DATE: 02/15/2017**

TABLE OF CONTENTS

1. Introduction.....1

2. Methodology1

3. Existing Sanitary Sewer System.....1

 3.1. Previous Studies1

 3.2. Existing Infrastructure2

4. Proposed Sanitary Sewer System.....2

 4.1. Sanitary Sewer Collection System2

 4.1.1 Sanitary Sewer Lift Station2

 4.2. Proposed Sanitary Sewer Main - Calculations.....3

5. Proposed Sanitary Sewer Treatment Facility3

6. Discussion/ Conclusions4

1. Introduction

The proposed Feather River Tentative Subdivision consists of 325-lots, with an average area of 7,720 square feet and is located in Eastern Washoe County adjacent to and westerly of the existing Stampmill Estates Development. The project is accessed via Stampmill Drive by way of State route 427, just northerly of the I-80 Exit 43 Interchange (SR 427 & I-80). The proposed project consists of 116+ acres located within Assessor's Parcel Numbers (APN's) 84-291-38 and 84-332-03. The project is located within Section-8 Township 20 North, Range 24 East. The general location of the project is indicated in Figure 1 (Vicinity Map).

The proposed sanitary sewer service for the Feather River Tentative Map will not connect to an existing public sanitary sewer system, as none exists. The residences within the existing Stampmill Estates Development are serviced by individual septic systems. The proposed sanitary sewer system for Feather River will be a new, stand-alone sanitary sewer system consisting of a new collection (laterals, sewer mains, manholes, lift station, force main, etc) and treatment system (treatment facility and effluent disposal via ground application and rapid infiltration basins). The proposed treatment facility is anticipated to be located west of the proposed development on adjacent lands owned by the Applicant / Developer (APN 84-040-08).

2. Methodology

Sanitary sewage flows were estimated utilizing the design criteria in Section 2 (Gravity Sewer Collection) of the Washoe County Engineering Design Standards. Average flows for the mains were estimated at 270-gallons per day per capita with 3-capita per dwelling unit (810-gallons/day/dwelling unit) with a peaking factor of 3.0, utilized to estimate Peak Flows ($810 * 3 * 325 \text{ units} = 789,750 \text{ GPD-PEAK}$). The Manning's equation was utilized with a roughness coefficient (n) of 0.012 for the PVC pipes (SDR35) to determine the capacities of the proposed gravity and force sanitary sewer mains. Design parameters dictate that velocities within sewer mains remain within a minimum of 2.5 fps and a maximum of 9.9 fps.

- $270 \text{ gpd} * 3 \text{ edu} = 810 \text{ gpd per residence}$
- $810 \text{ gpd} * 325 \text{ units} = 263,250 \text{ gpd (avg wastewater influent - 0.27 MGD)}$
- $263,250 \text{ gpd} * 3.0 \text{ Peaking Factor} = 789,750 \text{ GPD-PEAK}$
- $789,750 \text{ GPD-PEAK} / 24 \text{ hr} / 60 \text{ min} = 548.4 \text{ gpm-PEAK}$

3. Existing Sanitary Sewer System

3.1. Previous Studies

Various preliminary sewer analysis / studies have been produced for the project area. However, they were not relied upon for this analysis, as those projects were not constructed.

3.2. Existing Infrastructure

No existing sanitary sewer infrastructure exists within the vicinity of the proposed development.

4. Proposed Sanitary Sewer System

4.1. Sanitary Sewer Collection System

The proposed sanitary sewer collection system for Feather River will comprise primarily of gravity flow through 8-inch diameter SDR 35 PVC, designed to be constructed at slopes that vary from a minimum of slope of 0.5% to an expected maximum slope of 5.5%. The 8" collection system will primarily slope southerly and eastward, to a common area located at the Southeast corner of the project, where a master sanitary sewer lift station is proposed to be located. This location is effectively the lowest area of the project and will enable all onsite sewage to gravity flow to the proposed lift station. A force main will then convey the flows from the lift station in a westerly direction along / within, the proposed Stampmill Drive extension to the western boundary of the project. The force main and utility access road will continue offsite in a north-westerly direction, to the proposed treatment facility located with APN 84-040-08. The proposed sanitary sewer collection and treatment facility are proposed to be publicly owned and maintained by Washoe County.

4.1.1 Sanitary Sewer Lift Station

The wet well for the sewage lift station has been sized for the proposed Feather River Development and will be sized to handle 263,250gpd (average daily flow).

- $325 \text{ dwelling units} * 810 \text{ gpd per dwelling unit} = 263,250 \text{ gpd}$

The lift station is envisioned to be a 3-pump station with a 10' diameter wet well, with the pumps sized to provide peak pumping rates with one pump out of service. Each pump will have the capacity of a 275+ gpm pumping rate.

- $548.44 \text{ gpm-PEAK} / 2 = 275 \text{ gpm}$ (split between 2 pumps)

The proposed lift station will be designed with a separate wet well and dry-well configuration, with associated access driveway, electrical services, and fencing to allow maintenance and protection of the lift station facility.

It is anticipated that the lift station may be constructed in phases to avoid operational problems during the initial phases of construction and habitation of the proposed Feather River Development. Constraining design details for the lift station (sizing, pump selection, operating levels, etc) and associated force main (velocities, sizing, storage times, etc) will be evaluated during the final design stages of the project with the Improvement Plans and construction details

for the proposed development. The approximate location of the lift station is presented on Figure 5 of 7.

4.2. Proposed Sanitary Sewer Main - Calculations

Maximum flowrate thru any sanitary sewer main within the proposed Feather River Development (at buildout) will be 549 gpm-PEAK. The proposed sanitary sewer main located in the vicinity of proposed Lots 1 and 317 represents the most constrained main within the development. Flows on the downstream side of Lots 1 and 317 near the intersection of the Stampmill Drive extension and Road 'E' are estimated at 549 gpm-PEAK. This is anticipated to be an 10" main with a slope of 0.008ft/ft (0.8%) and represents the most constrained point in the system. At peak flows, this pipe is calculated to convey the cumulative peak flows (549 gpm-PEAK) and be 55% full with a velocity of 4.1 fps. Average Day flows for this pipe, result in the main being 30% full with a velocity of 3.0 fps.

Upstream of the 10" main within Road 'E', near the intersection of Road 'J' and Road 'E', there are two 8" mains that represent the next two most constrained pipes within the system; 239.6 gpm-PEAK (Road 'J' – adj to Lot 92) and 421.9 gpm-PEAK (Road 'E' – adj to Lot 314) respectively.

- The sewer main in Road 'J' has a tributary area of 142 Lots and a slope of 0.008 ft/ft (0.8%) and is calculated to be @ 47% full with a velocity of 3.3 fps at peak flowrates.
- While the sewer main in Road 'E' and referenced above, has a tributary area of 250 Lots and a slope of .016 ft/ft (1.6%) and is calculated to be 54% full with a velocity of 4.9 fps at peak flowrates.
- $Q = VA = (1.49/N)AR^{2/3} \sqrt{S}$ with $N = .012$

Final design of the sewer mains/collection system and associated sewer report will occur at a later date (slope / depth / velocities / etc) with the design of the development Improvement plans. However, the proposed collection system will be adequately sized with 8" PVC SDR 35 mains and 10" PVC SDR 35 trunk main to the proposed Lift Station. The alignment of the sanitary sewer system is presented on Figures 4 of 7 and 5 of 7.

5. Proposed Sanitary Sewer Treatment Facility

The proposed wastewater treatment facility and effluent disposal site is proposed to be on lands owned by the developer, located westerly and adjacent to the Proposed Feather River Subdivision. Final siting will be dependent upon geotechnical analysis and fulfillment/compliance with permitting requirements from all jurisdictional agencies. Permitting for the treatment facility is anticipated to require approval from the following agencies prior to construction and operation; Washoe County Public Works, Washoe County District Health, NDEP Bureau of Air Pollution Control, and NDEP Bureau of Water Pollution Control. (Note: additional jurisdictional

agencies may be involved, dependent upon site constraints, the above list is not meant to be all inclusive)

It is anticipated that the treatment site will be twenty five plus (25+) acres in size, with the footprint of the treatment facility anticipated to be less than two acres (structures), and encompass all the facilities required for treatment, storage, and disposal of effluent. Facilities anticipated:

1. New wastewater treatment plant
 - a. Headworks / Biologic treatment / clarifiers / splitter box / Operations facility / return activated sludge pump station / sludge handling facility / etc;
2. Rapid Infiltration Basins (RIBs);
3. Groundwater monitoring well(s);
4. Influent force main and access roadway;
5. Electrical facilities / pumping stations;
6. Re-use area (plant nursery for utilizing treated effluent via drip irrigation);
7. Fencing, lighting, signage, etc.

The developer will work with Washoe County to determine parameters for site selection (geotechnical investigation, setbacks, re-use, RIB's, etc) and determination of type of treatment facility to be used, prior to final design and subsequent submittals for permitting. The treatment facility is expected to utilize RIBs to allow treated water to infiltrate into the soil substrate. Treated effluent will flow via gravity to a series of RIBs. Site investigation will include double-ring infiltrometer testing by the project geotechnical engineer to determine infiltration rates and classify soils of the proposed RIBs. Natural attenuation including filtration, absorption, and precipitation will occur as the effluent moves through the RIBs and soils substrate. Effluent will eventually flow into the groundwater aquifer, as such, groundwater monitoring wells will be necessary to determine recharge and flow rates. These monitoring well locations will be determined in cooperation with the project geotechnical engineer, NDEP, and Washoe County. Additionally, limited irrigation of a nursery site with the treated water is anticipated, with plant types and irrigation demands to be determined, based on testing of the treated effluent at time of operation. Certain trees, shrubs, and alfalfa/grass crops have historically proven to be able to utilize effluent and provide nitrate uptake.

No industrial waste is anticipated at the treatment facility, solid wastes such as plastics, sticks, stones, sand, etc will be collected at the headworks and hauled to the Regional Landfill for disposal. Waste activated sludge will be handled with special handling and disposal requirements as per Nevada Sewage and Landfill regulations (NAC 444).

6. Discussion/ Conclusions

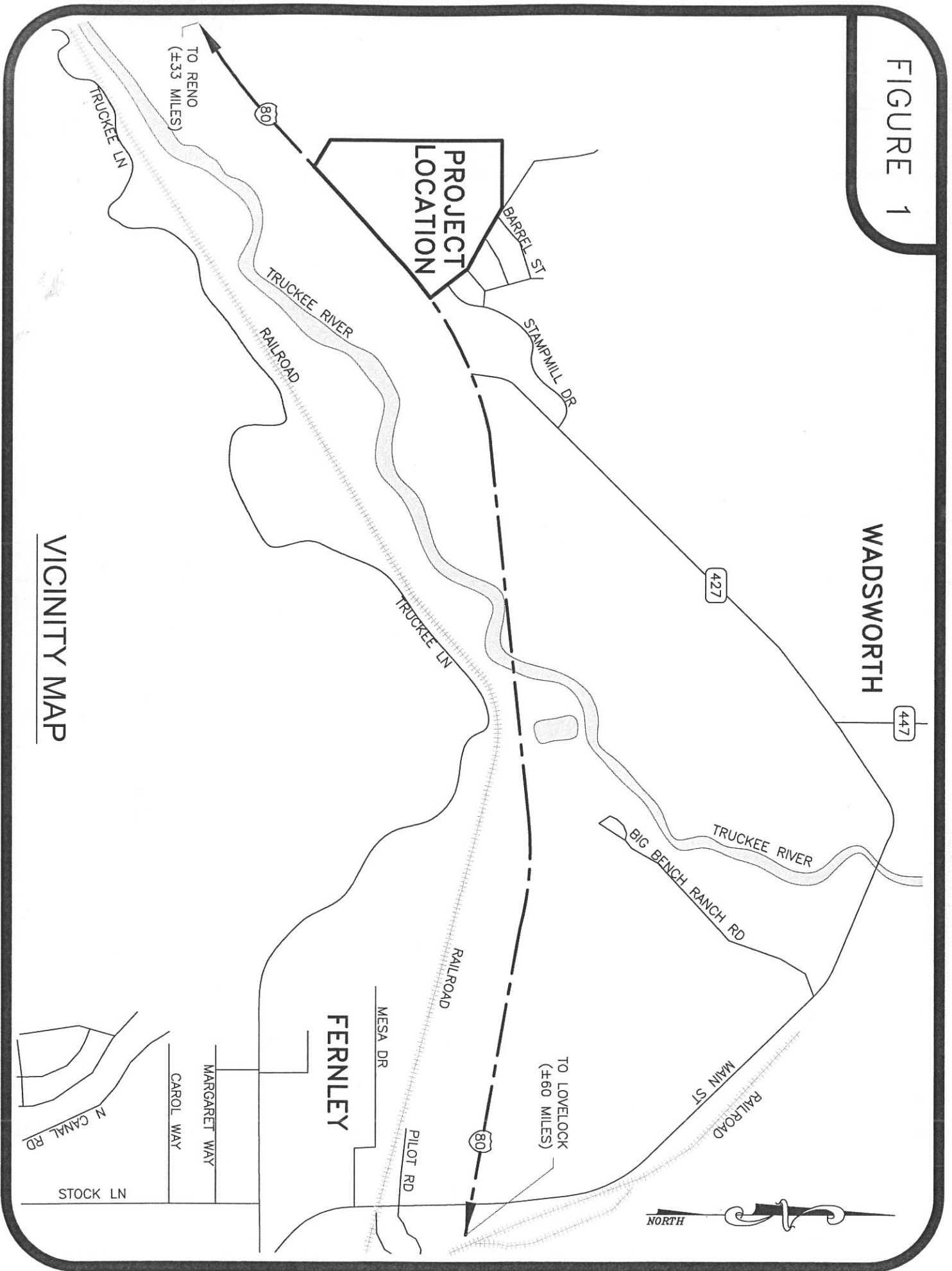
The average sewage flow that could be generated by the Feather River Development is 0.27 MGD, and will be treated by a new wastewater facility. Peak sewer flows within the collection system are anticipated to be 549GPM and can be adequately conveyed through the development

via 8" and 10" sewer mains. The proposed lift station will be sized to adequately accept and pump peak sewage inflows to the afore mentioned treatment facility. The proposed sanitary sewer and treatment facility has been designed in accordance with Washoe County Code. Prior to permitting for construction a final sewer report, treatment site evaluation, treatment plant selection, operations manual, design details, and bonding for the treatment facility, lift station, and sewer collection mains will be produced in accordance with NRS, NAC, NDEP, and Washoe County codes and submitted to all regulatory agencies (Washoe County Engineering, Washoe District Health, NDEP at a minimum) for review, comment, and approval.

REFERENCES

- *Washoe County Department of Water Resources, Engineering Design Standards, Section 2 (Gravity Sewer Collection Design Standards) dated May, 2010*
- *N.A.C. chapters 278 (Planning / Zoning) and 444 (sanitation)*

FIGURE 1

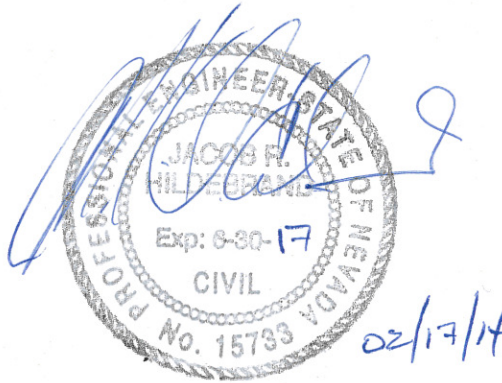


VICINITY MAP

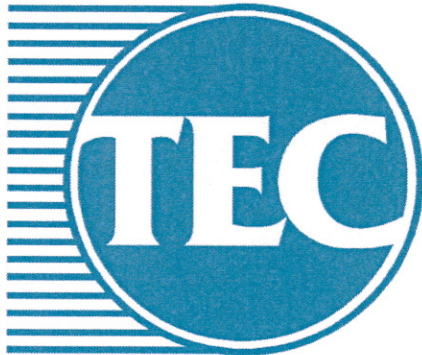
**FEATHER RIVER
TENTATIVE SUBDIVISION MAP
325 SINGLE FAMILY RESIDENTIAL LOTS**

PRELIMINARY HYDROLOGY REPORT

**PREPARED FOR:
AGUA FRIA INSURANCE SERVICES, LLC**



PREPARED BY



**CIVIL
ENGINEERING
CONSULTANTS**

**JOB #: AguaFria001
DATE: 2/15/2016**

Table of Contents

1.	Introduction.....	1
1.1.	Site Description	1
2.	Procedures	1
2.1.	Methodology	1
2.2.	Hydraulic Analyses.....	2
2.3.	Time of Concentration.....	2
2.4.	Flood Zones	3
3.	Existing Runoff Conditions	3
3.1.	Existing Storm Drain System	3
3.2.	Adjacent Runoff Areas.....	3
3.2.1.	Basin to the North	3
3.2.2.	Basin to the East.....	4
3.2.3.	Basin to the South	4
3.2.4.	Runoff from the West.....	4
3.3.	Onsite Runoff.....	4
4.	Proposed Runoff Conditions	4
4.1.	Proposed Runoff Areas.....	4
4.2.	Proposed Storm Drain System	5
5.	Discussion/ Conclusions	5
6.	References.....	7

1. Introduction

1.1. Site Description

The proposed Feather River Subdivision is a 325-lot development project in the Washoe County Unincorporated area of Wadsworth, Nevada. The project falls upon two adjacent parcels of land, APN 084-291-38 AND 084-332-03 totaling 116.6-acres. The project is bounded on the north side by a vacant BLM property, and on the east by the existing 47-lots of Stampmill Estates Residential Subdivision, to the south by Interstate 80, and to the west by 084-040-08, a full section (Sec 7) of private land which is also owned by the subject property. As such the adjacent parcel to the west is available for the creation of easements for drainage facilities, travel routes and utilities, however is not considered to be a part of this Tentative Map application.



Existing Site (Aerial View)

No areas of the subject site are located within a 100-Year Floodplain as shown on the Flood Insurance Rate Map. The project is located in the W 1/2 of Section 8, T20N, R24E, in Washoe County, Nevada. The location of the project is depicted in Figure-1 (vicinity map). The project site consists of two moderately vegetated sage brush vacant lots that have no structures or buildings upon them. The project site generally drains toward the south east corner of the property. The site slopes from the west to the east at approximately a 1.5% grade. The northerly 1/3 of the subject site is steeper than the southerly portion. The northerly 1/3 slopes from north to south at an average grade of 4.5%. The southerly 2/3rds of the site slopes very mildly at 0.5% grade from north to south. New storm drain infrastructure is proposed to be included with the developed portion of the project and will discharge to natural drainage ways.

2. Procedures

The project has been designed in accordance with the *Truckee Meadows Regional Drainage Manual* and the *Washoe County Development Code Storm Drain Standards* (Article 420), to determine the drainage requirements of the proposed Feather River Subdivision. A master drainage report is proposed to be completed prior to the first phase, and subsequent drainage reports with the construction documents of each phase of the project, to be submitted for review and approval prior to the recordation of any final subdivision map associated with this project.

2.1. Methodology

Due to the size of the project, +/- 117 Acres and 325 residential lots, the Soils Conservation Service Technical Report Manual 55 method (SCS TR-55) was utilized to determine the existing and proposed peak runoff rates. The U.S. Army Corp of Engineers software, HEC-HMS was utilized to model the drainage

runoff for existing conditions prior to the development of this site and to model the drainage runoff for proposed developed conditions.

All applicable codes and standards as shown within the *Truckee Meadows Regional Drainage Manual* and the *Washoe County Development Code Storm Drain Standards* (Article 420), were considered and incorporated with the analysis, and creation of the TR-55 method drainage model.

2.2. Hydraulic Analyses

A hydraulic analysis has not been conducted due to the preliminary nature of tentative reports. A final drainage report is to be completed with the construction documents, submitted for review and approved prior to the recordation of any final subdivision map associated with this project.

2.3. Time of Concentration

The time of concentration (t_c) from the site for both the existing and proposed storm water conditions were used to determine the time to peak (t_p) of the unit hydrograph and subsequently the peak runoff through the site. The time to peak, or lag time, is 0.6 times the time of concentration, according to SCS TR-55. The time of concentration is an addition of all the travel times of sheet flow, shallow concentrated flow, and channel flow.

Sheet flow is limited to 300 feet, using Manning's kinematic solution (Overtop and Meadows 1976) the travel time is found using Eqn. 1.

$$T_t = \frac{.007(n * L)^{0.8}}{(P_2)^{0.5}S^{0.4}} \quad \text{Eqn. 1}$$

Where:

T_t = Travel Time

n = Manning's roughness coefficient: Assumed 0.04 (rocky and bare soil)

L = Flow length (ft)

P_2 = 2-year, 24-hr rainfall (in)

S = slope of hydraulic grade line (land slope, ft/ft)

Shallow concentrated flow is used after a maximum flow length of 300 feet, and before a cross-section of a channel has been obtained. Figure 3-1 from the TR-55 manual outlines velocity vs. slope and travel time can be determined using Eqn. 2.

$$T_t = \frac{L}{3600V} \quad \text{Eqn. 2}$$

Where:

L = Flow length (ft)

V = Average velocity (ft/s)

Channel flow is used after a significant channel has been formed and appropriate dimensions can be used. Velocity can be found using Manning's equation. Travel time can then be found by using the velocity from Eqn. 3 in Eqn. 2.

Eqn. 3

$$V = \frac{1.49r^{\frac{2}{3}}s^{\frac{1}{2}}}{n}$$

Where:

V = Average velocity (ft/s)

R = Hydraulic radius (ft)

S = slope of hydraulic grade line (land slope, ft/ft)

n = Manning's roughness coefficient: Assumed 0.04 (rocky and bare soil)

2.4. Curve Number

Hydraulic soil group ratings were obtained from USGS Web Soil Survey. These values were used to determine curve numbers from Table 2-2c in TR-55. The weighted averages were used for each sub-basin in HEC-HMS.

2.5. Flood Zones

The proposed Feather River development is located within FEMA FIRM Map 32031C3127G, and the project lies within the Unshaded Zone X designation, indicating that the property is not within any 100 year floodplain. A copy of the FIRM Panel is provided in the Appendix.

3. Existing Runoff Conditions

3.1. Existing Storm Drain System

There are no available storm drain systems or infrastructure upstream (westerly or northerly) of the proposed development site. The existing 47-lots of Stampmill Estates Residential Subdivision and associated Rights Of Ways are located downstream, however no drainage is proposed to be released onto the existing roadways of Stampmill Estates.

3.2. Adjacent Runoff Areas

Offsite flows contributing to the proposed development are derived from an undeveloped, naturally vegetated areas to the west and north. Flows from these basins are of the channelized flow variety, and are to be captured on the west edge of the proposed development, conveyed around the project along the southerly boarder or captured on the north boundary of the project and conveyed through the project via underground storm drain pipes and discharge to their natural drainage course. Reference Figure 2.

3.2.1. Basin to the North

A small canyon that includes a water tank (Offsite Basin 2) will drain to the north westerly portion of the subject development; the flows of this canyon are to be captured within a detention pond and routed through the project via an underground storm drain system. An undeveloped hill to the east of the water tank canyon (Offsite Basin 3) will flow in sheet and shallow concentrated flow in a southerly direction

toward the residential lots. This shallow concentrated flow will be captured within a small cutoff ditch along the northerly boundary of the residential lots and convey flows easterly and ultimately southerly and discharge into an open channel proposed at the southerly boundary of the subject site.

3.2.2. Basin to the East

The existing 47-lots of Stampmill Estates Residential Subdivision are located immediately east of the proposed development and down gradient. The proposed development however anticipates routing all flows in a southerly direction prior to discharge, thereby circumventing any flows from discharge upon the roadways of Stampmill Estates.

3.2.3. Basin to the South

The area to the south of the proposed project is down gradient and consists of existing Interstate 80, and ultimately agriculture lands and the Truckee River beyond the highway to the South.

3.2.4. Runoff from the West

The area to the west of the proposed project consists of an 8,366.7 acre drainage basin (Offsite Basin 1) with a natural drainage wash of a depth of approximately 24 to 48 inches and a bottom width of approximately 6 feet. The drainage wash will be captured within the adjacent parcel (APN 084-040-08) and routed in a southerly direction along the westerly boundary of the subject site. Upon reaching the southerly boundary of the site (Interstate 80), the wash will bend and route along the southerly boundary immediately adjacent to Interstate 80's Right of Way and discharge to its natural location east of the subject property.

3.3. Onsite Runoff

Pre-development runoff areas and patterns are detailed in Figure 3. The runoff generally flows from the west boundary of the project in a southeasterly direction. The project site has historically been a vacant naturally vegetated lot, the site has not been previously graded. Areas north and south of the property have facilities in place that route drainage away from the project.

The existing peak runoff rates generated from the project and the adjacent contributing runoff area are negligible for the 5-year and 100-year storm events, due to the high infiltration rates of the site.

4. Proposed Runoff Conditions

4.1. Proposed Runoff Areas

The proposed runoff boundaries, as well as catch basins and storm drain mains, are detailed in Figure 2. Runoff areas for the site are all included into one sub-areas, although with final design each hydrologic drainage area will be calculated as a contributing area individually. The site was delineated enough to provide a sufficient preliminary design. An in-depth analysis of individual curve numbers per basin were also not calculated. The off-site areas are labeled Offsite-1, Offsite-2, and Offsite-3. Runoff from proposed development will be collected by the proposed storm drain system of the development, discharged into detention ponds throughout the project within common areas, and then discharge to a channel along the southerly property line adjacent to Interstate 80, and routed to their natural pattern.

As indicated in Table 1, the proposed runoff area will generate 110 and 190 CFS of peak runoff for the 5-year and 100-year storms, respectively.

Table 1: The modeled peak runoffs for the offsite areas running into the site, the existing site, and the proposed site using HEC-HMS, running TR-55.

TABLE 1 FEATHER RIVER PROPOSED RUNOFF SUMMARY					
SUBAREA	AREA	WEIGHTED C VALUE	TIME OF CONCENTRATION	PEAK RUNOFF	
				5-YEAR	100- YEAR
#	ACRES	UNITLESS	HOURS	CFS	
OFFSITE BASIN 1	8366.7	74	2.234	28.20	778.3
OFFSITE BASIN 2	25.2	77	0.167	4.50	23.4
OFFSITE BASIN 3	25.7	77	0.12	4.70	25
EXISTING ONSITE BASIN	116.6	35	0.04	0.00	0.9
PROPOSED ONSITE BASIN	116.6	35	0.256	110.00	190

4.2. Proposed Storm Drain System

The proposed project will use a combination of open channels, roadway concrete curbs and gutters, and Type 3 and Type 4R catch basins, and detention ponds to capture, convey and mitigate post flow increases over historical flow rates. The proposed drainage system will be fully designed and sized with the final production of the civil improvement plans and construction documents, will include a final hydrologic and hydraulic analysis that will be reviewed and approved by Washoe County prior to the recordation of any final subdivision map.

5. Discussion/ Conclusions

The Feather River residential subdivision is a proposed 325-lot single-family home development encompassing approximately 116.59 acres in the Wadsworth area of Washoe County, Nevada. The development has been designed to adequately drain, and the storm drain system has been designed to convey the runoff generated from the project.

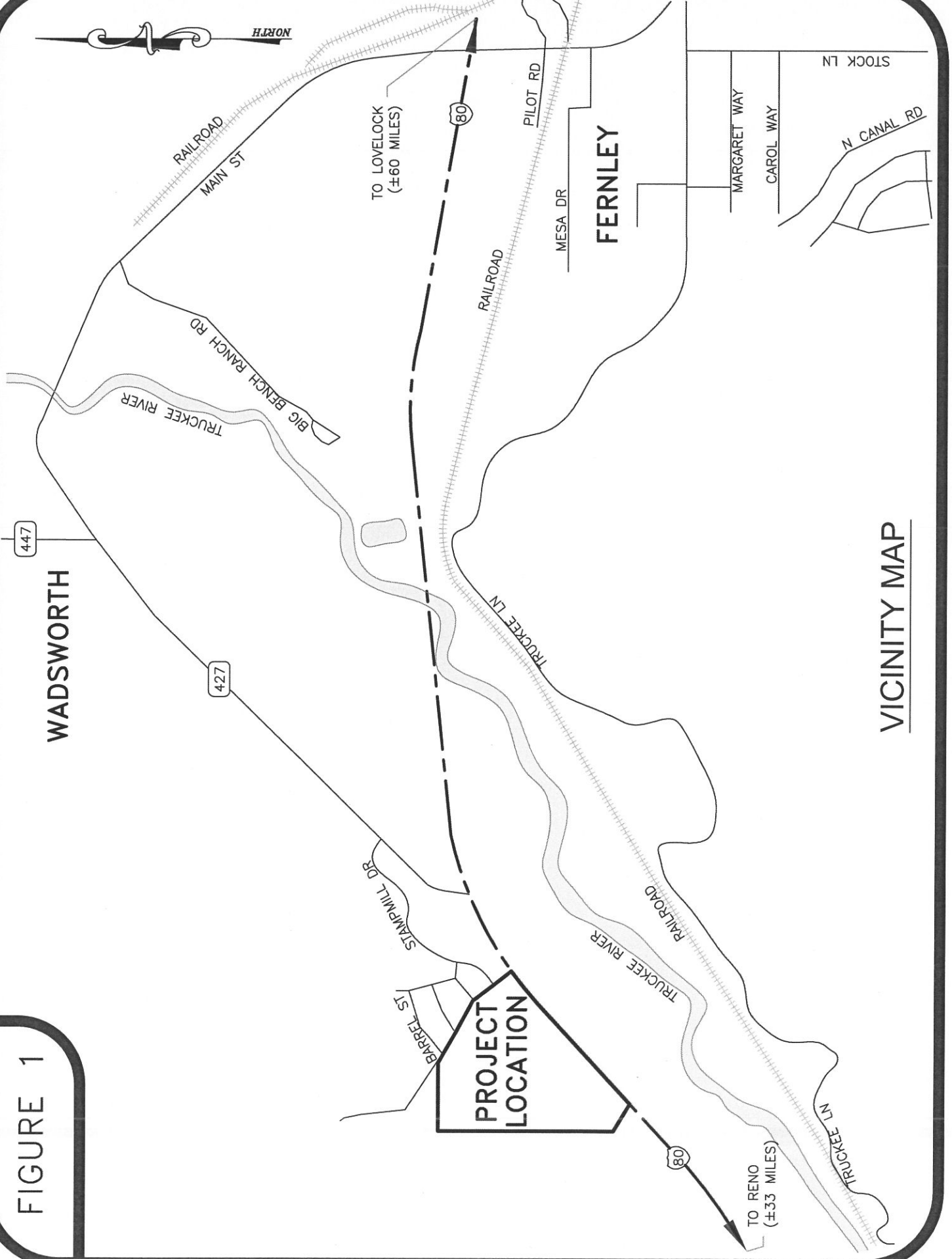
Off-site runoff will flow through the site via a proposed open channel that routes all flows from the west in a southerly and then easterly direction. All flows from the north will be conveyed through the site via underground storm drain infrastructure, or via a small surface ditch that would bisect the common area between the Feather River Lots and those of Stampmill Estates. All on-site roadway improvements will be asphalt facilities with concrete curbs, gutters and sidewalks. Runoff will be conveyed either upon the surface of the streets in conformance with Washoe County and Truckee Meadows Regional Flood standards or captured and piped underground through the project until such a point that it would be discharged into a detention pond. The detention ponds will discharge to a drainage channel to be located along the southerly property boundary and discharged within its natural drainage course east of the site.

The proposed improvements will provide more than the required detention and restriction of peak flows from 5-year and 100-year storm events. The proposed release rates of detained water will also be below pre development flow conditions. Overall drainage patterns are not expected to change as a result of the project. The proposed project design conforms to existing county and state regulations.

6. References

- *Washoe County Public Works Design Manual, Section 2 (Storm Runoff)* dated January, 2009
- *Truckee Meadows Regional Drainage Manual* dated April, 2009
- *Hydrologic Modeling System HEC-HMS* dated March, 2000
- *Urban Hydrology for Small Watersheds (TR-55)* dated June 1986

FIGURE 1



WADSWORTH

FERNLEY

PROJECT
LOCATION

VICINITY MAP

NORTH

TO LOVELOCK
(±60 MILES)

TO RENO
(±33 MILES)

STOCK LN

N CANAL RD

MARGARET WAY

CAROL WAY

MESA DR

PILOT RD

RAILROAD
MAIN ST

BIG BENCH RANCH RD
TRUCKEE RIVER

RAILROAD

TRUCKEE LN

TRUCKEE RIVER
RAILROAD

TRUCKEE LN

STAMP MILL DR

BARREL ST

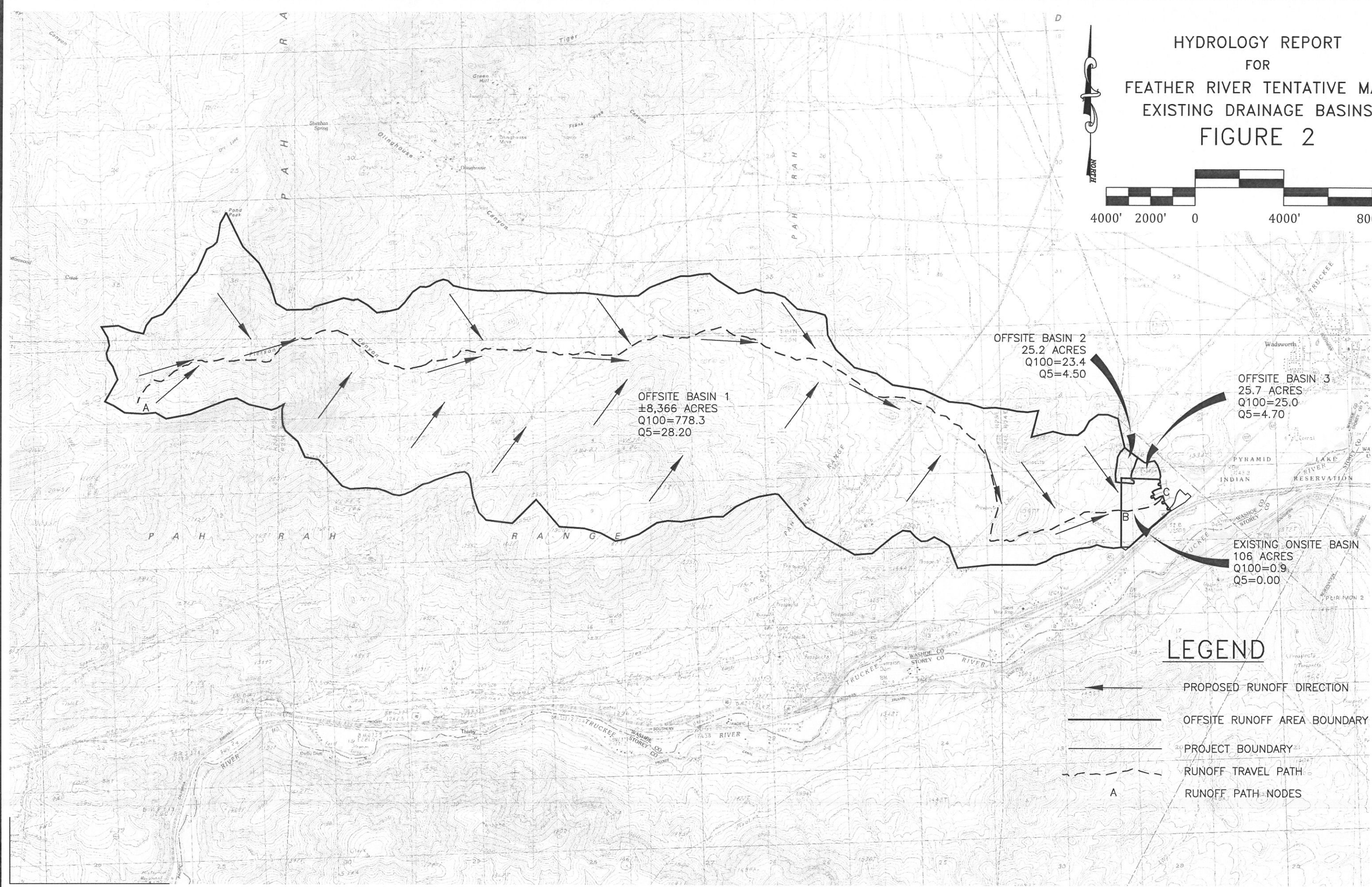
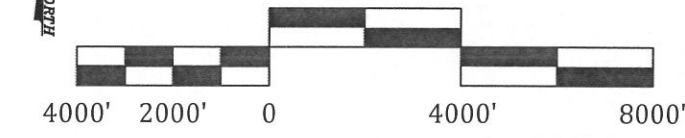
447

427

80

80

HYDROLOGY REPORT
 FOR
 FEATHER RIVER TENTATIVE MAP
 EXISTING DRAINAGE BASINS
 FIGURE 2



OFFSITE BASIN 1
 ±8,366 ACRES
 Q100=778.3
 Q5=28.20

OFFSITE BASIN 2
 25.2 ACRES
 Q100=23.4
 Q5=4.50

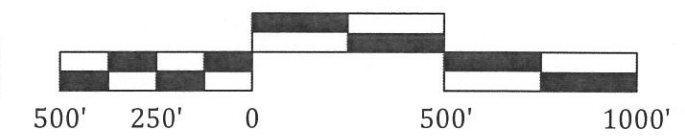
OFFSITE BASIN 3
 25.7 ACRES
 Q100=25.0
 Q5=4.70

EXISTING ONSITE BASIN
 106 ACRES
 Q100=0.9
 Q5=0.00

LEGEND

- ← PROPOSED RUNOFF DIRECTION
- OFFSITE RUNOFF AREA BOUNDARY
- PROJECT BOUNDARY
- - - - RUNOFF TRAVEL PATH
- A RUNOFF PATH NODES

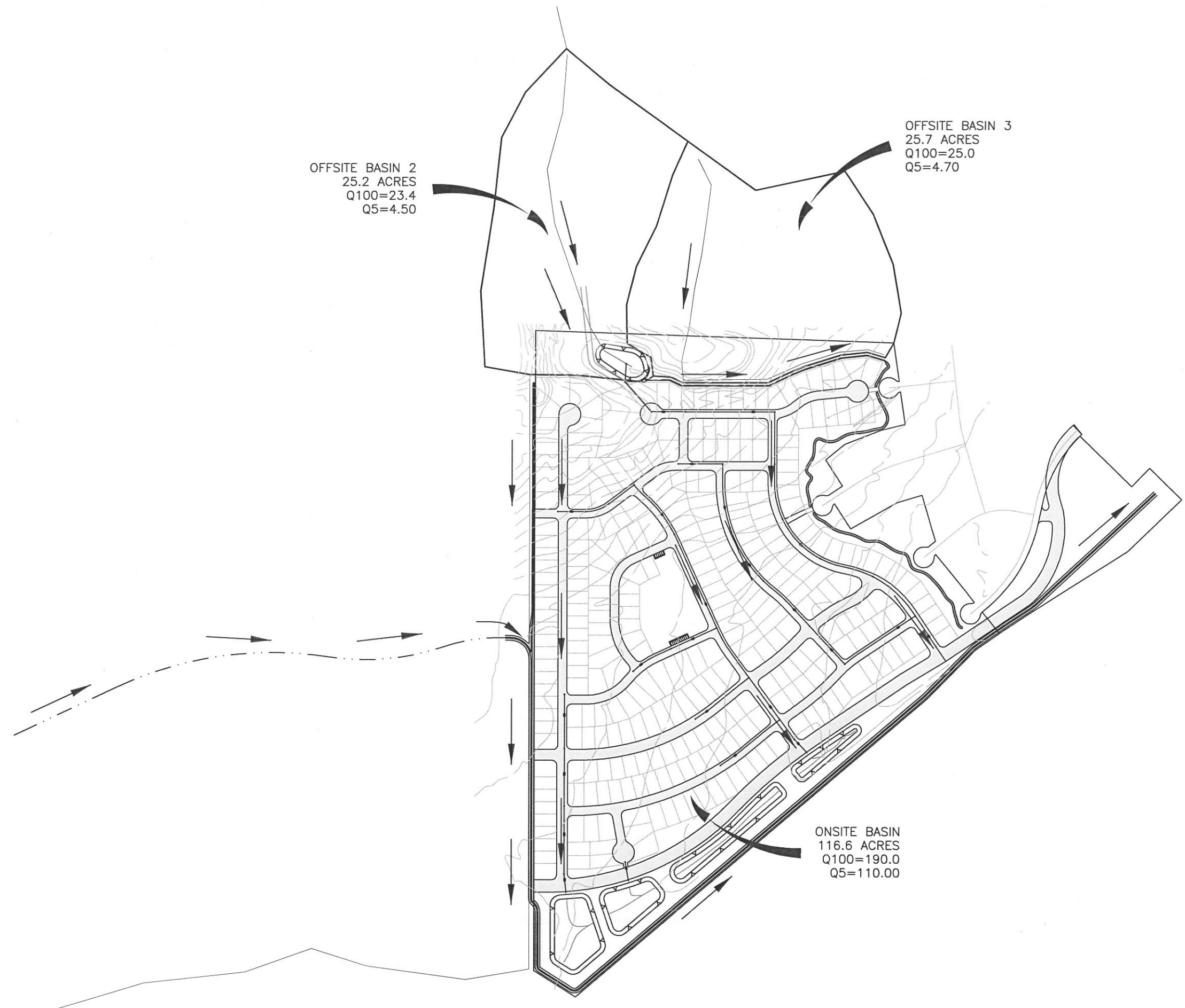
HYDROLOGY REPORT
 FOR
 FEATHER RIVER TENTATIVE MAP
 DEVELOPED DRAINAGE BASINS
 FIGURE 3





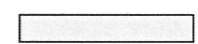



OFFSITE BASIN 2
 25.2 ACRES
 Q100=23.4
 Q5=4.50

OFFSITE BASIN 3
 25.7 ACRES
 Q100=25.0
 Q5=4.70

ONSITE BASIN
 116.6 ACRES
 Q100=190.0
 Q5=110.00



LEGEND

-  PROPOSED RUNOFF DIRECTION
-  HYDROLOGIC BASIN
-  AC
-  SD MAIN
-  STORM WATER CHANNEL
-  TOPOGRAPHY

Washoe County
Unincorporated Areas
320019

ZONE X

NOTE: MAP AREA SHOWN ON THIS PANEL
IS LOCATED WITHIN TOWNSHIP 20 NORTH,
RANGE 23 EAST AND TOWNSHIP
20 NORTH, RANGE 24 EAST.

7

8

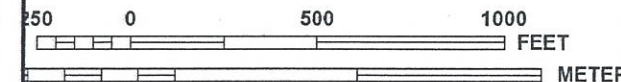
43 88^{000m}N

43 87^{000m}N

3131



MAP SCALE 1" = 500'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 3127G

FIRM
FLOOD INSURANCE RATE MAP

WASHOE COUNTY,
NEVADA
AND INCORPORATED AREAS

PANEL 3127 OF 3475
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
WASHOE COUNTY	320019	3127	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
32031C3127G

MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Project: AGUAFRIA Simulation Run: 5 YEAR (EXISTING SITE)

Start of Run: 02Feb2017, 00:00

Basin Model: SITE EXISTING

End of Run: 04Feb2017, 00:00

Meteorologic Model: 5 YEAR STORM

Compute Time: 14Feb2017, 14:04:04

Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SITE EXISTING	0.182	0.0	02Feb2017, 00:00	0.00
Junction-1	0.182	0.0	02Feb2017, 00:00	0.00

Project: AGUAFRIA Simulation Run: 100 YEAR (EXISTING SITE)

Start of Run: 02Feb2017, 00:00

Basin Model: SITE EXISTING

End of Run: 04Feb2017, 00:00

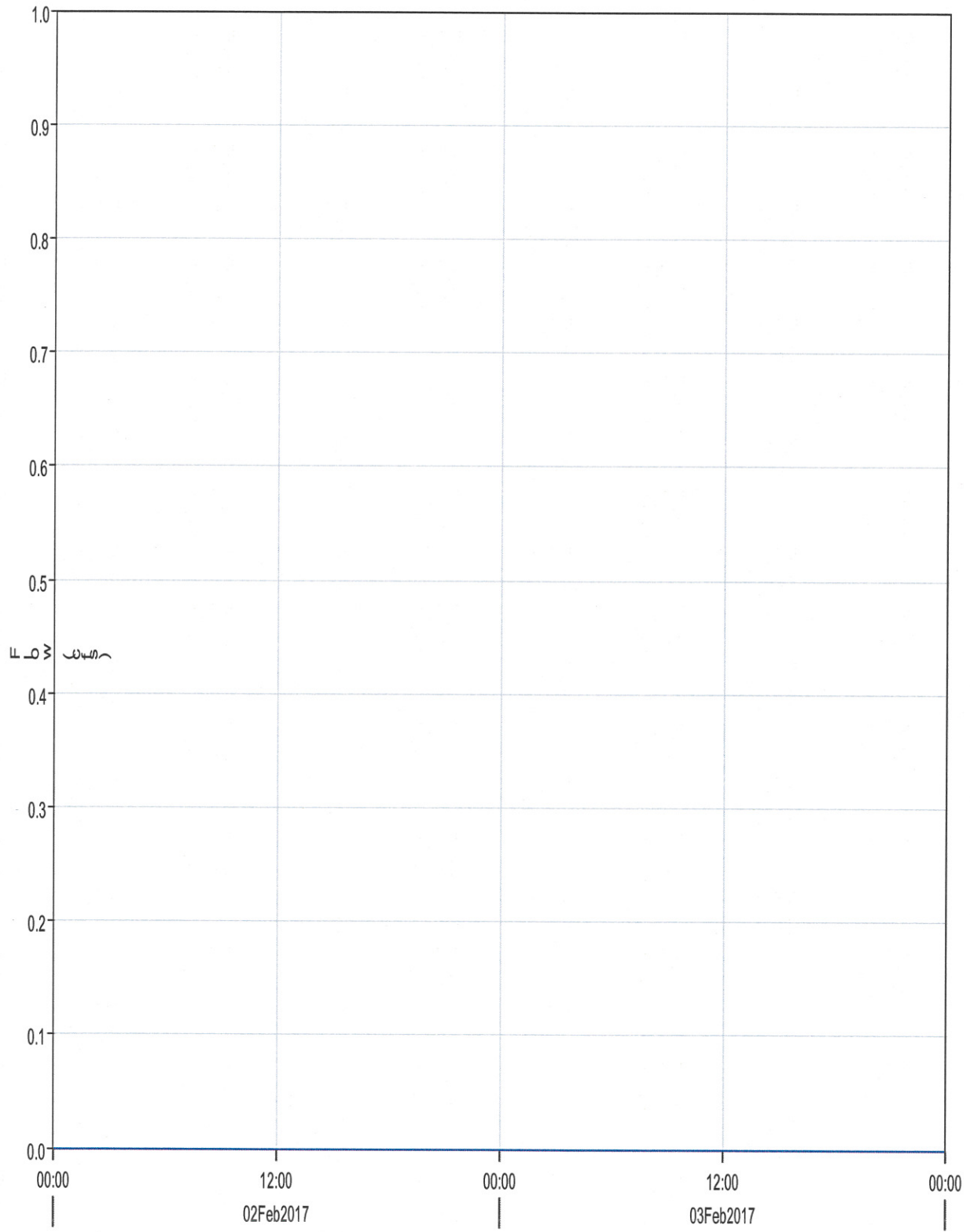
Meteorologic Model: 100 YEAR STORM

Compute Time: 14Feb2017, 12:38:39

Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SITE EXISTING	0.182	0.9	02Feb2017, 13:20	0.07
Junction-1	0.182	0.9	02Feb2017, 13:20	0.07

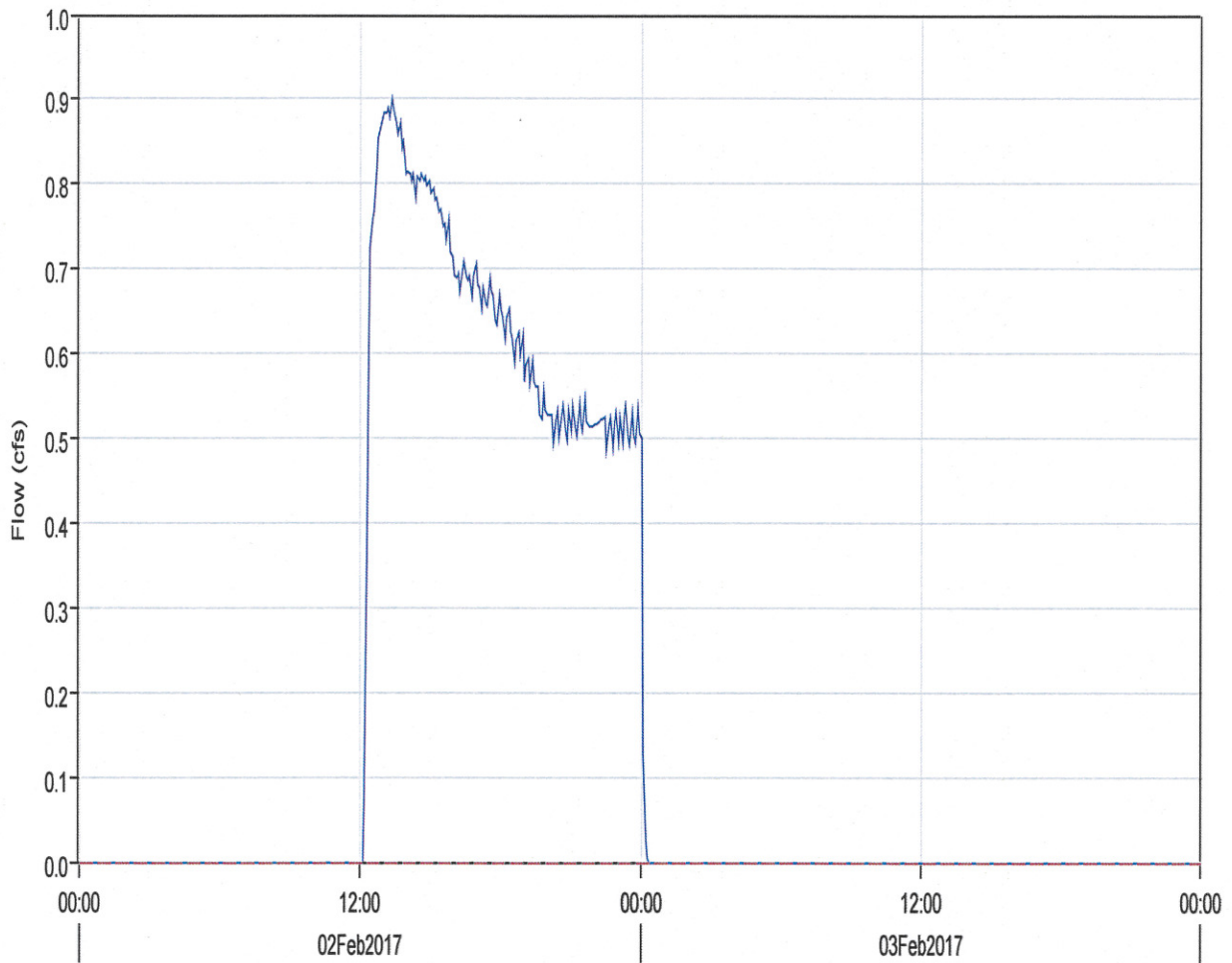
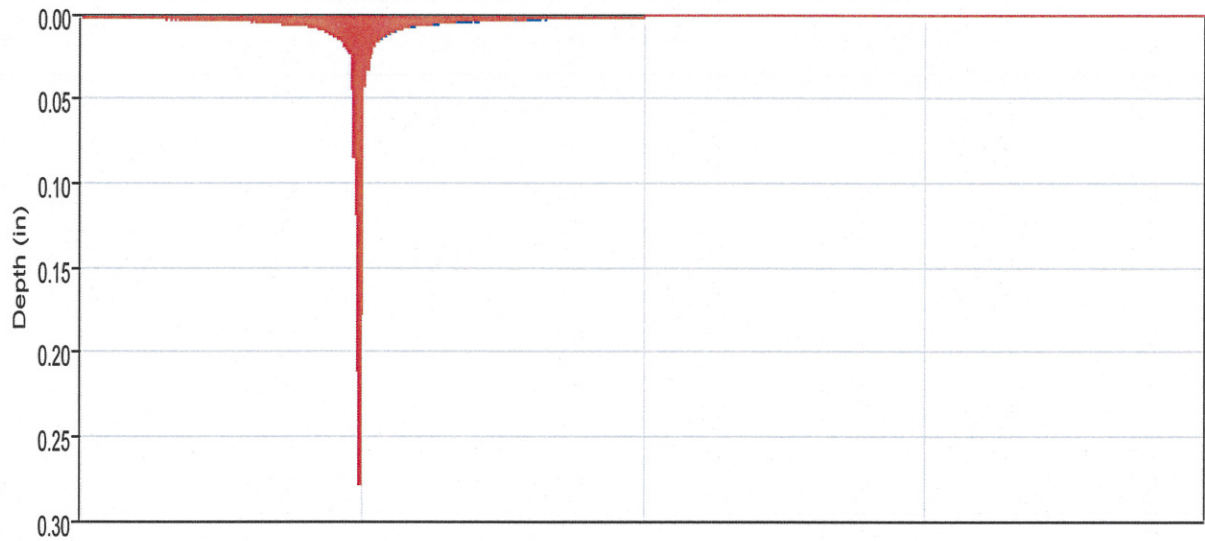
Junction "Junction-1" Results for Run "5 YEAR (EXISTING SITE)"



— Run:5 YEAR (EXISTING SITE) Element:Junction-1 Result:Outflow

- - - Run:5 YEAR (EXISTING SITE) Element:SITE EXISTING Result:Outflow

Subbasin "SITE EXISTING" Results for Run "100 YEAR (EXISTING SITE)"



Run:100 YEAR (EXISTING SITE) Element:SITE EXISTING Result:Precipitation Run:100 YEAR (EXISTING SITE) Element:SITE EXISTING Result:Precipitation Loss
Run:100 YEAR (EXISTING SITE) Element:SITE EXISTING Result:Outflow Run:100 YEAR (EXISTING SITE) Element:SITE EXISTING Result:Baseflow

Project: AGUAFRIA Simulation Run: 5 YEAR (OFFSITE 3)

Start of Run: 02Feb2017, 00:00

Basin Model: OFFSITE 3

End of Run: 04Feb2017, 00:00

Meteorologic Model: 5 YEAR STORM

Compute Time: 14Feb2017, 14:04:08

Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.0402	4.7	02Feb2017, 12:00	0.17
END	0.0402	4.7	02Feb2017, 12:00	0.17

Project: AGUAFRIA Simulation Run: 100 YEAR STORM (OFFSITE 3)

Start of Run: 02Feb2017, 00:00

Basin Model: OFFSITE 3

End of Run: 04Feb2017, 00:00

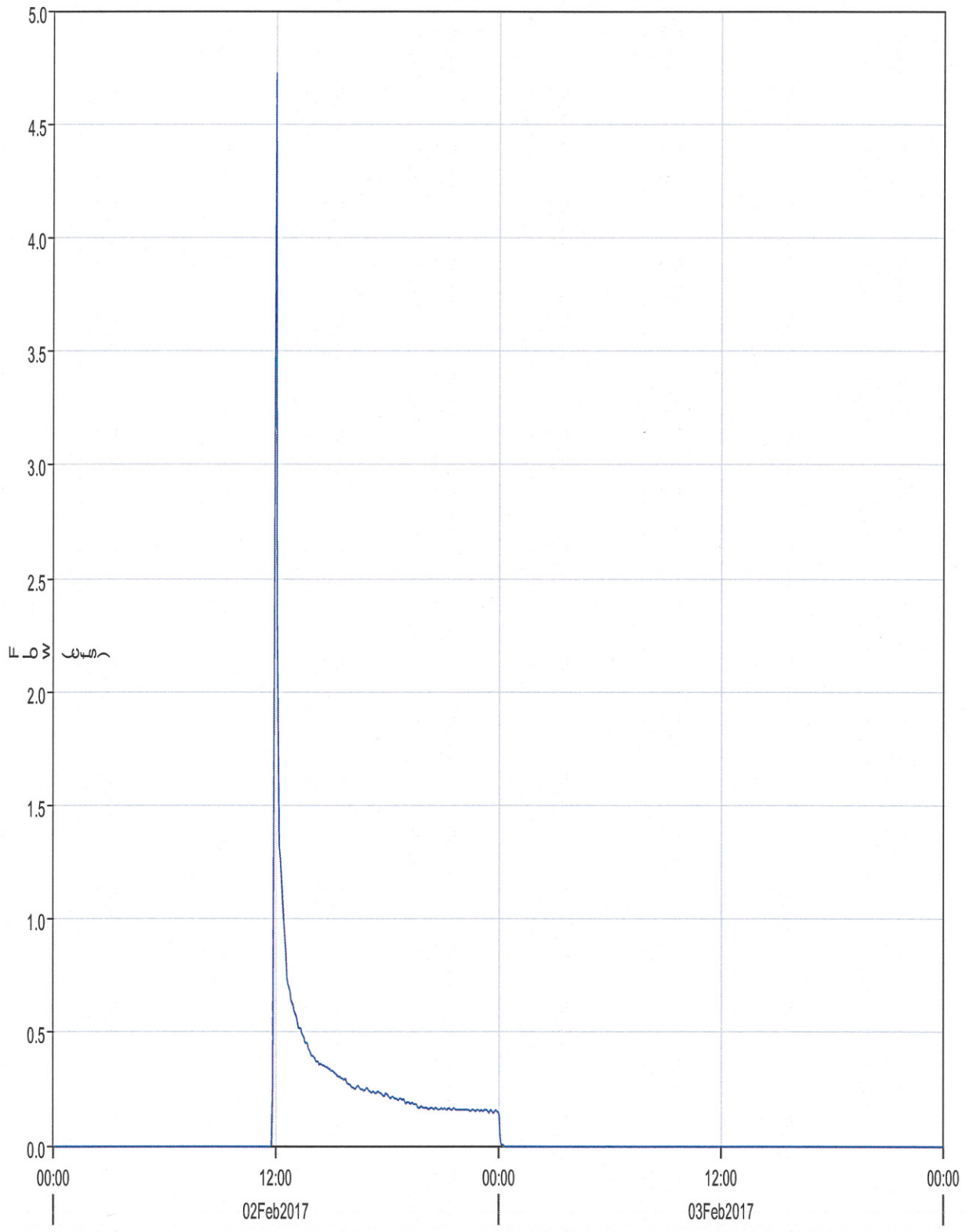
Meteorologic Model: 100 YEAR STORM

Compute Time: 14Feb2017, 08:06:10

Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.0402	25.0	02Feb2017, 11:55	0.68
END	0.0402	25.0	02Feb2017, 11:55	0.68

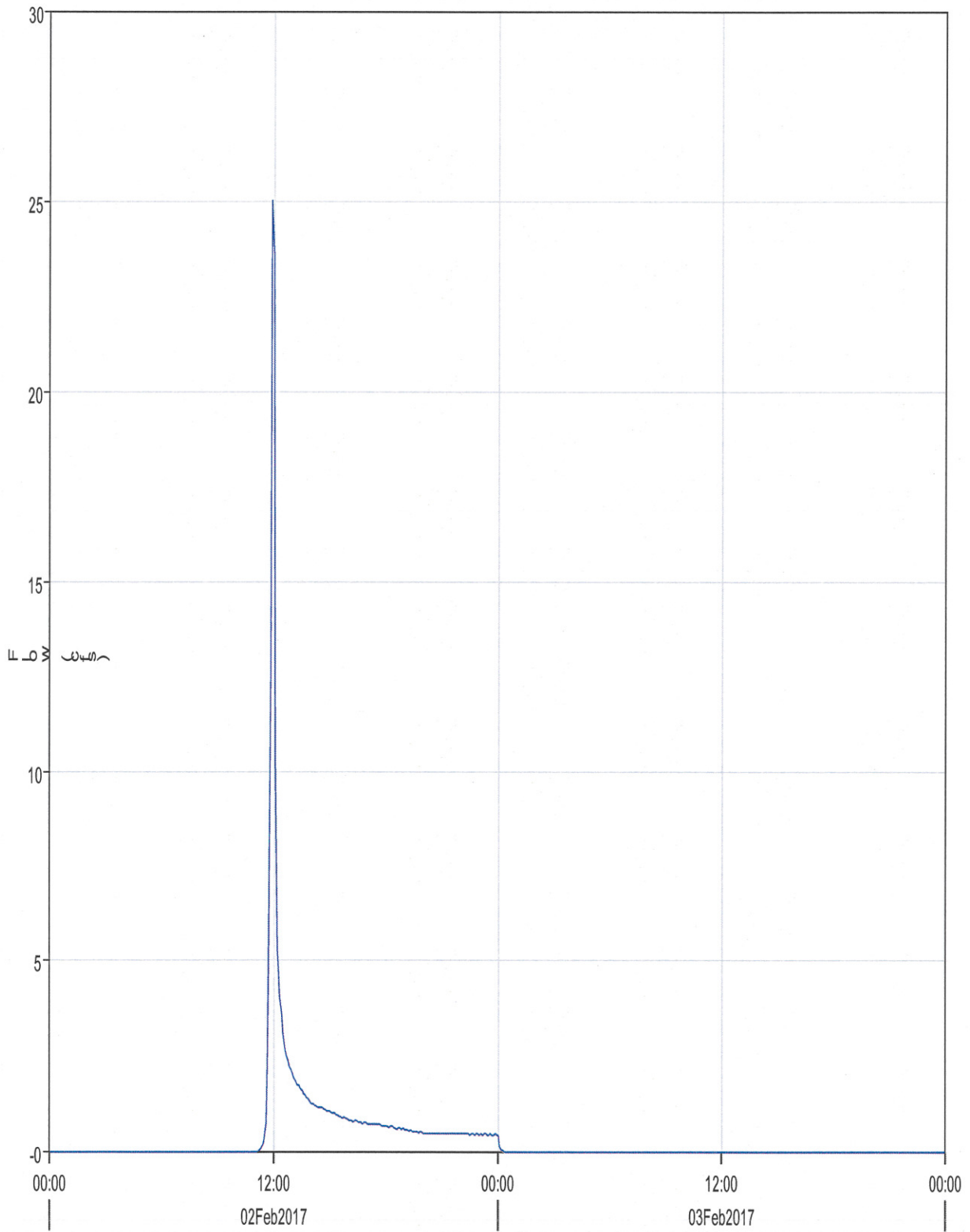
Junction "END" Results for Run "5 YEAR (OFFISTE 3)"



— Run:5 YEAR (OFFISTE 3) Element:END Result:Outflow

- - - Run:5 YEAR (OFFISTE 3) Element:Subbasin-1 Result:Outflow

Junction "END" Results for Run "100 YEAR STORM (OFFSITE 3)"



Run:100 YEAR STORM (OFFSITE 3) Element:END Result:Outflow

Run:100 YEAR STORM (OFFSITE 3) Element:Subbasin-1 Result:Outflow

Project: AGUAFRIA Simulation Run: 5 YEAR (OFFSITE 2)

Start of Run: 02Feb2017, 00:00

Basin Model: OFFSITE 2

End of Run: 04Feb2017, 00:00

Meteorologic Model: 5 YEAR STORM

Compute Time: 14Feb2017, 14:04:12

Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.039345	4.5	02Feb2017, 12:00	0.17
DETENTION POND	0.039345	4.5	02Feb2017, 12:00	0.17

Project: AGUAFRIA Simulation Run: 100 YEAR STORM (OFFSITE 2)

Start of Run: 02Feb2017, 00:00

Basin Model: OFFSITE 2

End of Run: 04Feb2017, 00:00

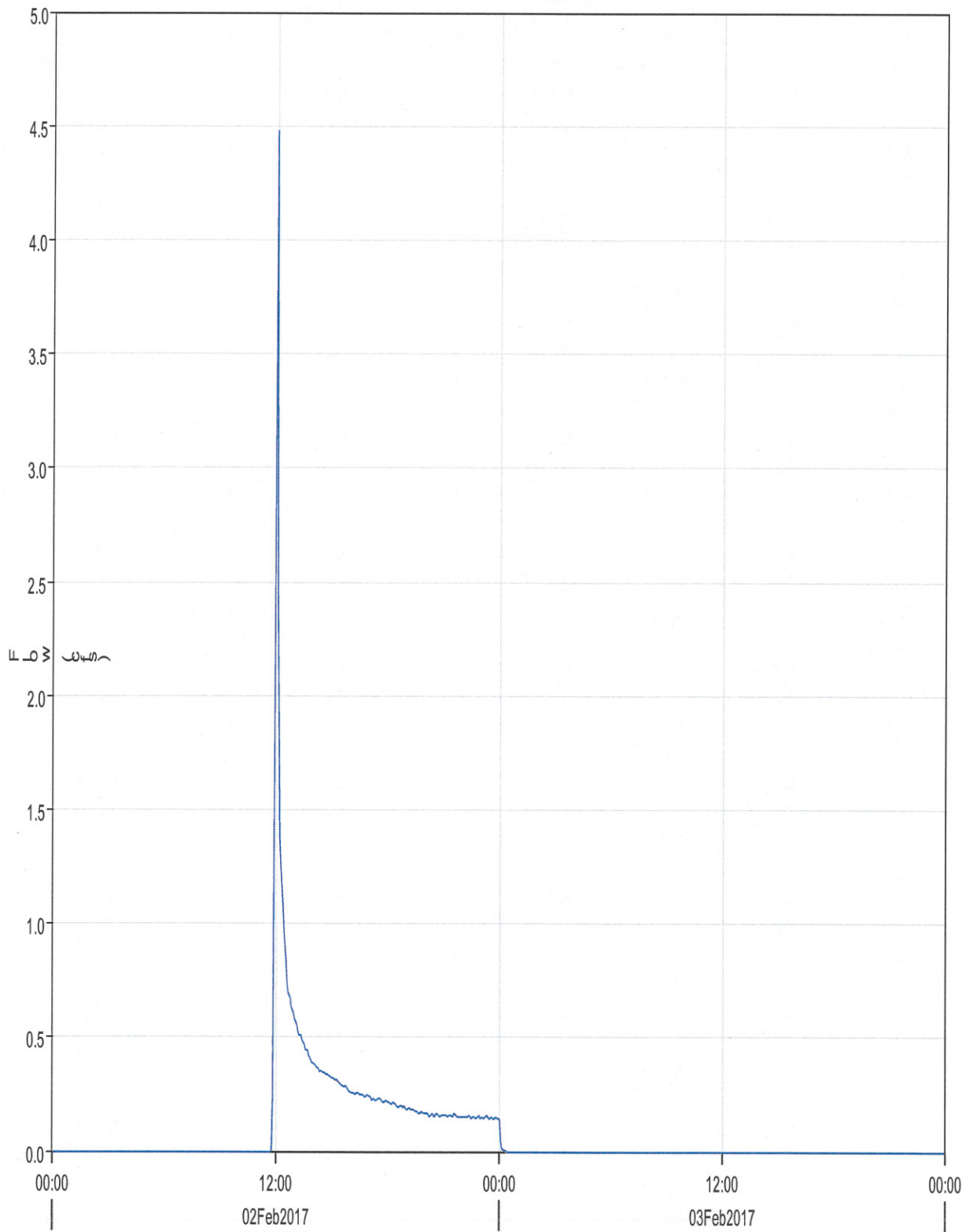
Meteorologic Model: 100 YEAR STORM

Compute Time: 14Feb2017, 08:03:26

Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.039345	23.4	02Feb2017, 11:55	0.68
DETENTION POND	0.039345	23.4	02Feb2017, 11:55	0.68

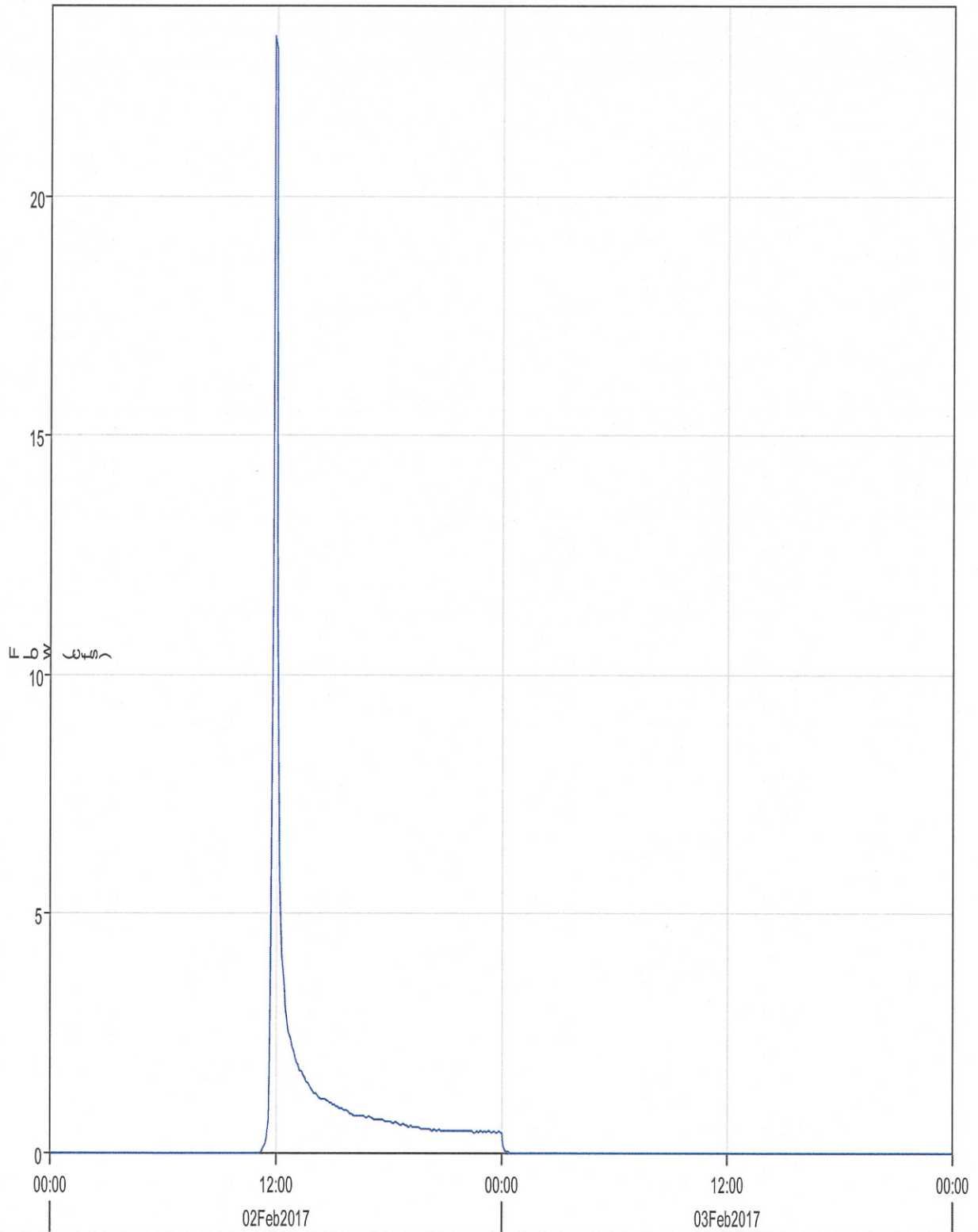
Junction "DETENTION POND" Results for Run "5 YEAR (OFFSITE 2)"



— Run:5 YEAR (OFFSITE 2) Element:DETENTION POND Result:Outflow

- - - Run:5 YEAR (OFFSITE 2) Element:Subbasin-1 Result:Outflow

Junction "DETENTION POND" Results for Run "100 YEAR STORM (OFFSITE 2)"



— Run:100 YEAR STORM (OFFSITE 2) Element:DETENTION POND Result:Outflow - - - Run:100 YEAR STORM (OFFSITE 2) Element:Subbasin-1 Result:Outflow

Project: AGUAFRIA Simulation Run: 5 YEAR STORM OFFSITE 1

Start of Run: 02Feb2017, 00:00

Basin Model: OFFSITE 1

End of Run: 04Feb2017, 00:00

Meteorologic Model: 5 YEAR STORM

Compute Time: 14Feb2017, 15:47:06

Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	13.03	28.2	02Feb2017, 15:35	0.03
sheet	13.03	28.2	02Feb2017, 15:35	0.03
shallow2	13.03	28.2	02Feb2017, 15:35	0.03
channel1	13.03	28.2	02Feb2017, 15:50	0.03
channel2	13.03	28.2	02Feb2017, 15:55	0.03
channel3	13.03	28.2	02Feb2017, 16:05	0.03
channel4	13.03	28.2	02Feb2017, 16:35	0.03
channel5	13.03	28.2	02Feb2017, 17:45	0.03
TO SITE	13.03	28.2	02Feb2017, 17:45	0.03

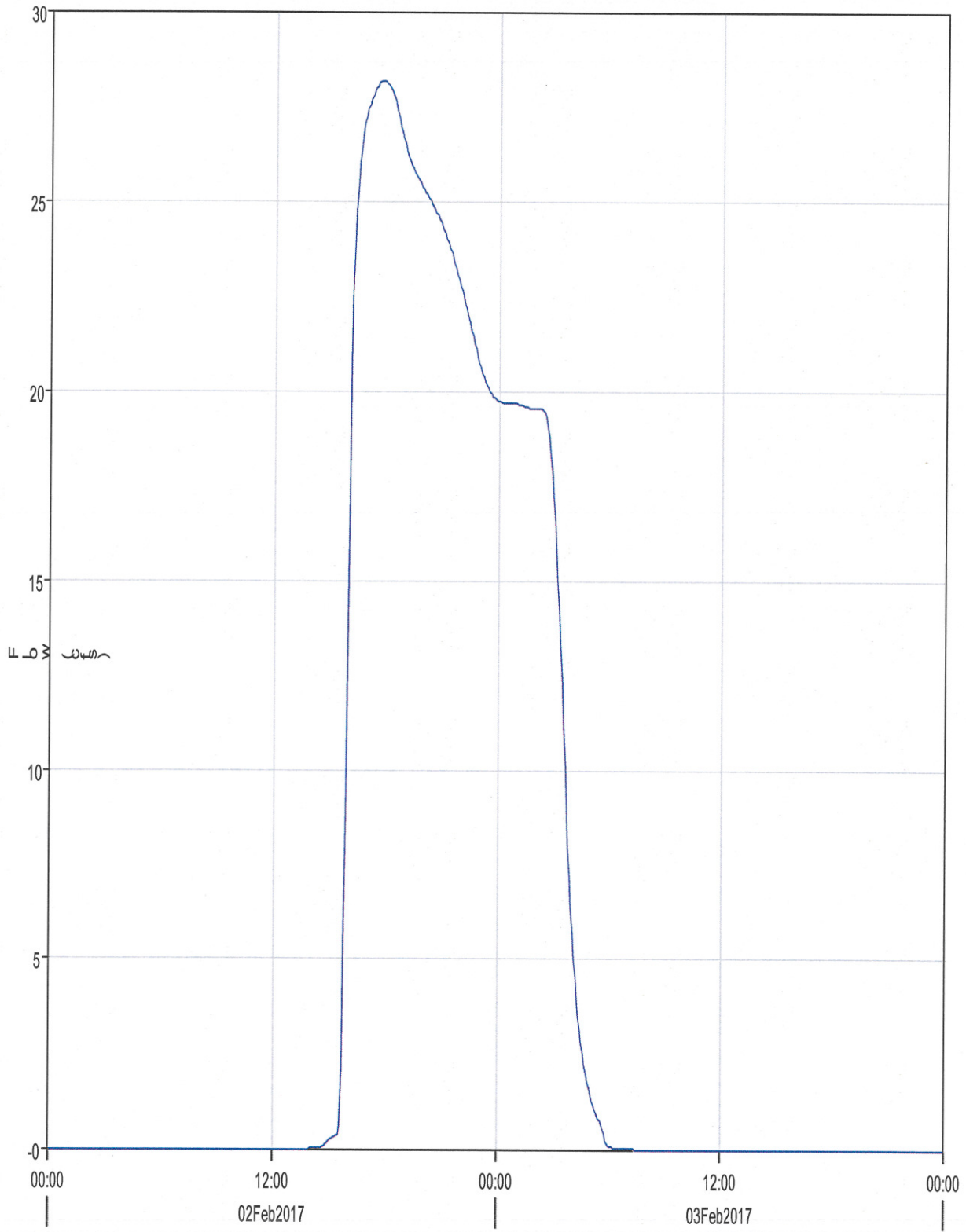
Project: AGUAFRIA Simulation Run: 100 YEAR STORM OFFSITE 1

Start of Run: 02Feb2017, 00:00
End of Run: 04Feb2017, 00:00
Compute Time: 14Feb2017, 15:47:01

Basin Model: OFFSITE 1
Meteorologic Model: 100 YEAR STORM
Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	13.03	778.3	02Feb2017, 12:55	0.32
sheet	13.03	778.1	02Feb2017, 12:55	0.32
shallow2	13.03	777.9	02Feb2017, 12:55	0.32
channel1	13.03	776.0	02Feb2017, 13:00	0.32
channel2	13.03	773.6	02Feb2017, 13:05	0.32
channel3	13.03	771.6	02Feb2017, 13:10	0.32
channel4	13.03	769.3	02Feb2017, 13:20	0.32
channel5	13.03	767.5	02Feb2017, 13:50	0.32
TO SITE	13.03	767.5	02Feb2017, 13:50	0.32

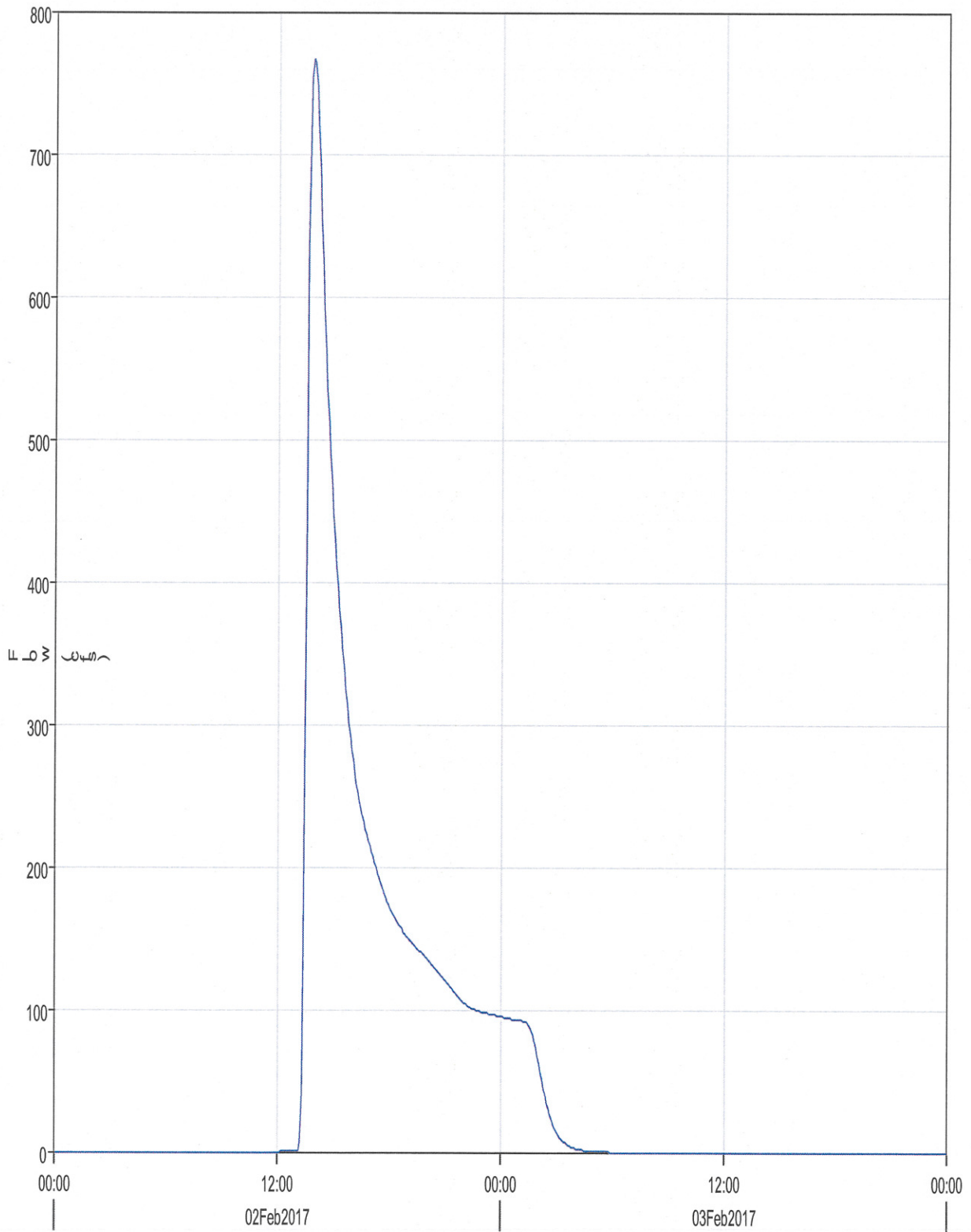
Junction "TO SITE" Results for Run "5 YEAR STORM OFFSITE 1"



— Run:5 YEAR STORM OFFSITE 1 Element:TO SITE Result:Outflow

- - - Run:5 YEAR STORM OFFSITE 1 Element:channel5 Result:Outflow

Junction "TO SITE" Results for Run "100 YEAR STORM OFFSITE 1"



— Run:100 YEAR STORM OFFSITE 1 Element:TO SITE Result:Outflow

- - - Run:100 YEAR STORM OFFSITE 1 Element:channel5 Result:Outflow

Project: AGUAFRIA Simulation Run: 100 YEAR (PROPOSED SITE)

Start of Run: 02Feb2017, 00:00

Basin Model: PROPOSED

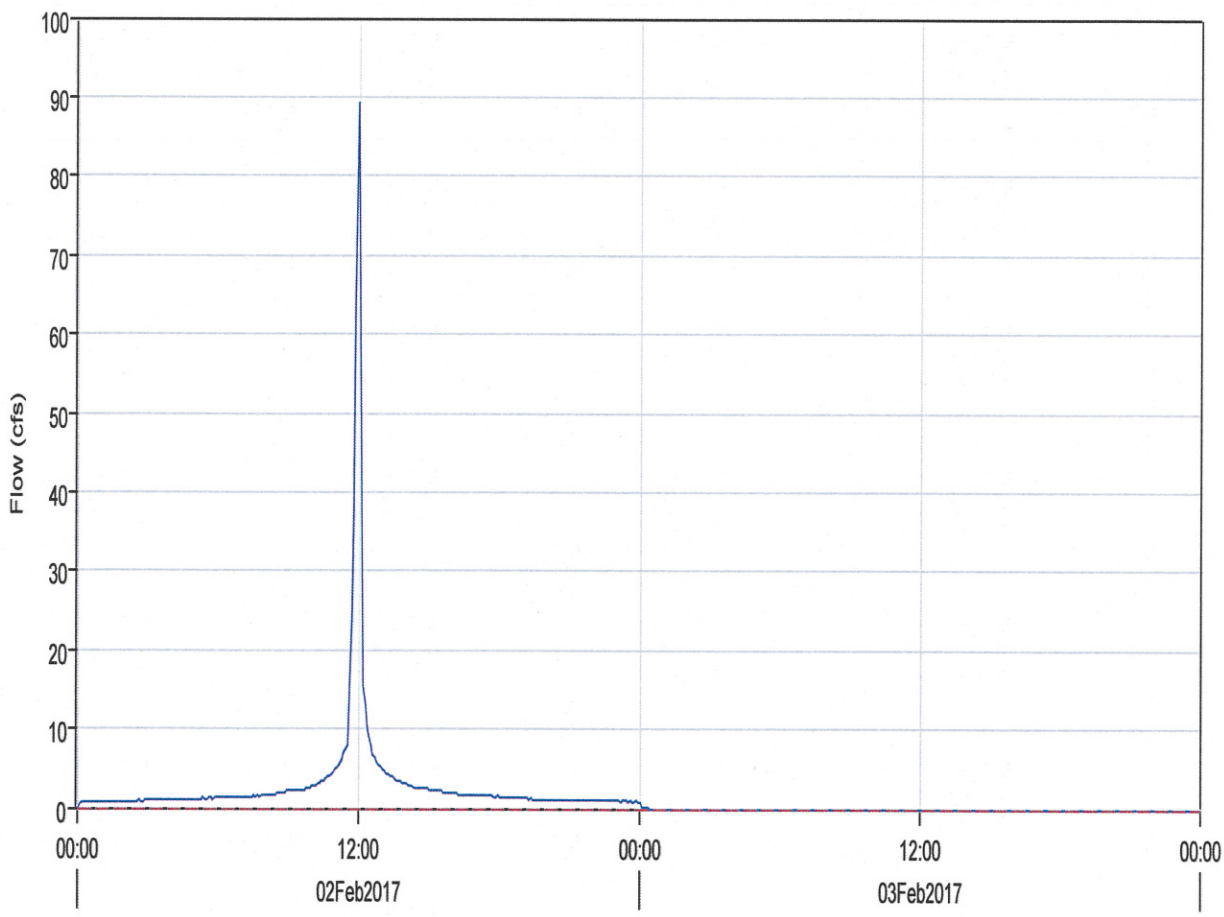
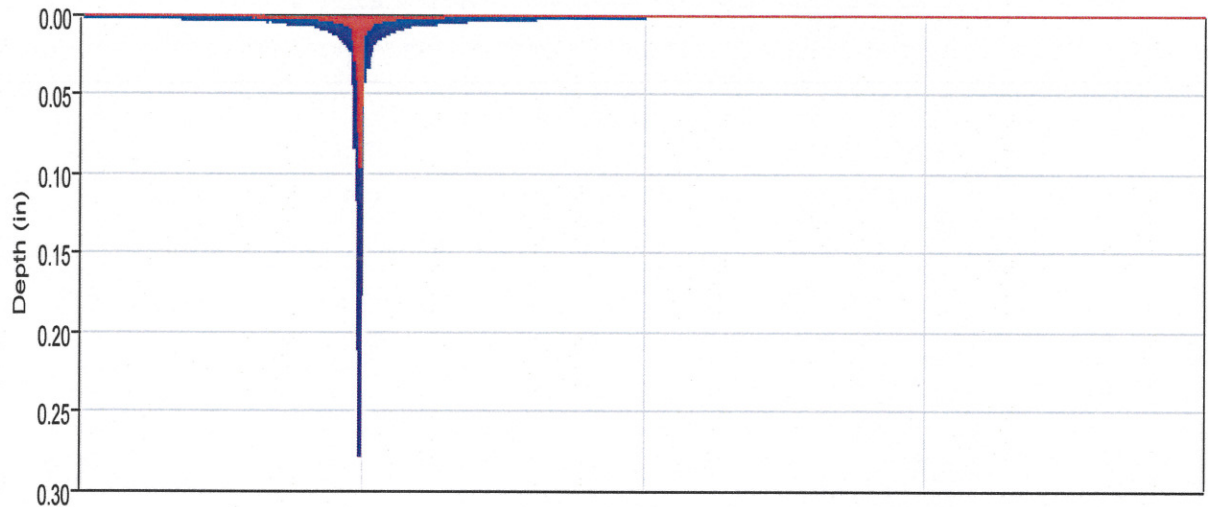
End of Run: 04Feb2017, 00:00

Meteorologic Model: 100 YEAR S

Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

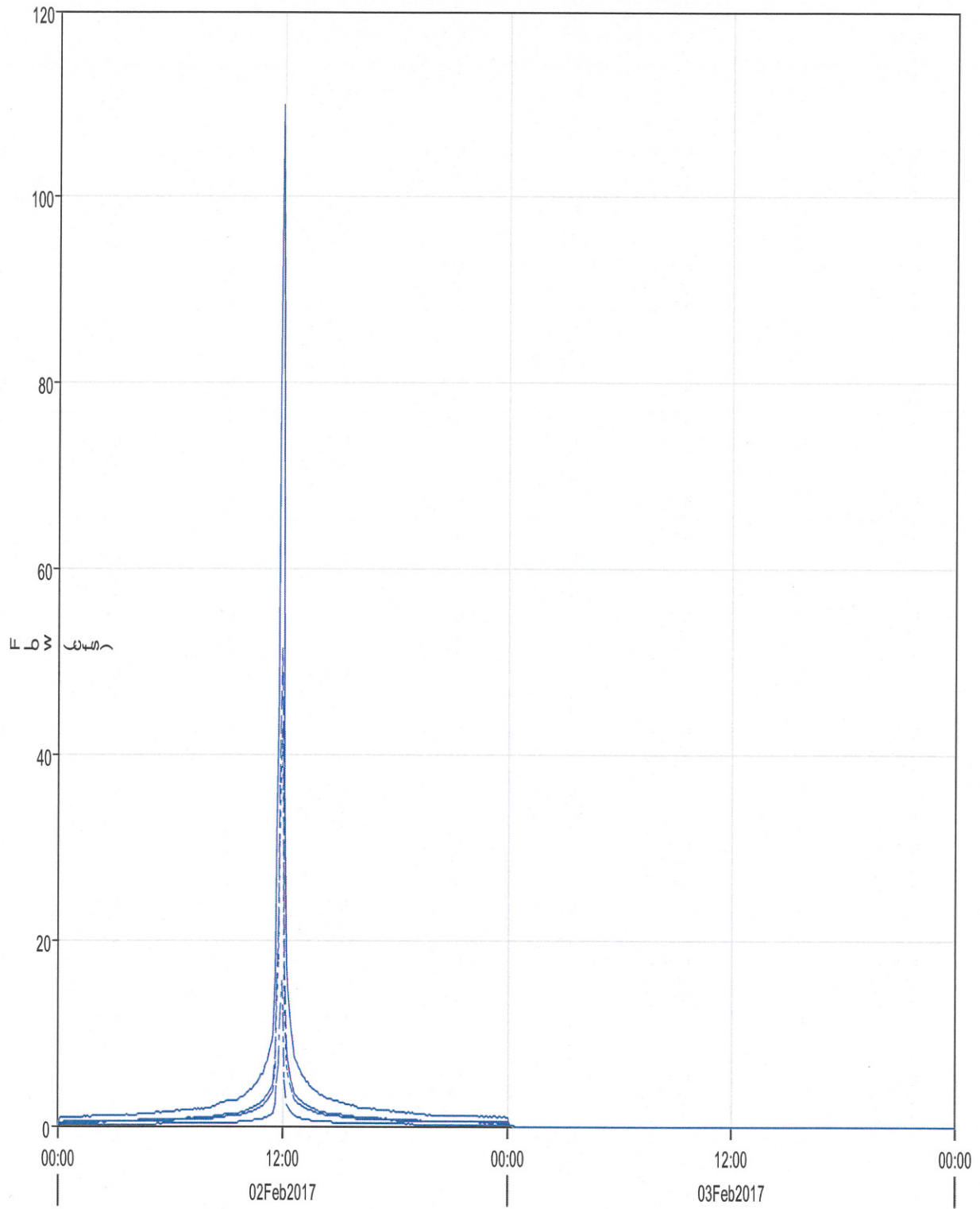
Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-2	0.0700690	89.4	02Feb2017, 11:55	1.62
Subbasin-3	0.0573381	74.2	02Feb2017, 11:55	1.62
Subbasin-1	0.0209321	27.1	02Feb2017, 11:55	1.62
End	0.14834	190.7	02Feb2017, 11:55	1.62

Subbasin "Subbasin-2" Results for Run "100 YEAR (PROPOSED SITE)"



- Run:100 YEAR (PROPOSED SITE) Element:Subbasin-2 Result:Precipitation EXPIRED
- Run:100 YEAR (PROPOSED SITE) Element:Subbasin-2 Result:Precipitation Loss EXPIRED
- Run:100 YEAR (PROPOSED SITE) Element:Subbasin-2 Result:Outflow EXPIRED
- Run:100 YEAR (PROPOSED SITE) Element:Subbasin-2 Result:Baseflow EXPIRED

Junction "End" Results for Run "5 YEAR (PROPOSED SITE)"



— Run:5 YEAR (PROPOSED SITE) Element:End Result:Outflow EXPIRED - - - Run:5 YEAR (PROPOSED SITE) Element:Subbasin-2 Result:Outflow EXPIRED
- · - · - Run:5 YEAR (PROPOSED SITE) Element:Subbasin-3 Result:Outflow EXPIRED - · - · - Run:5 YEAR (PROPOSED SITE) Element:Subbasin-1 Result:Outflow EXPIRED

Project: AGUAFRIA Simulation Run: 5 YEAR (PROPOSED SITE)

Start of Run: 02Feb2017, 00:00

Basin Model: PROPOSED

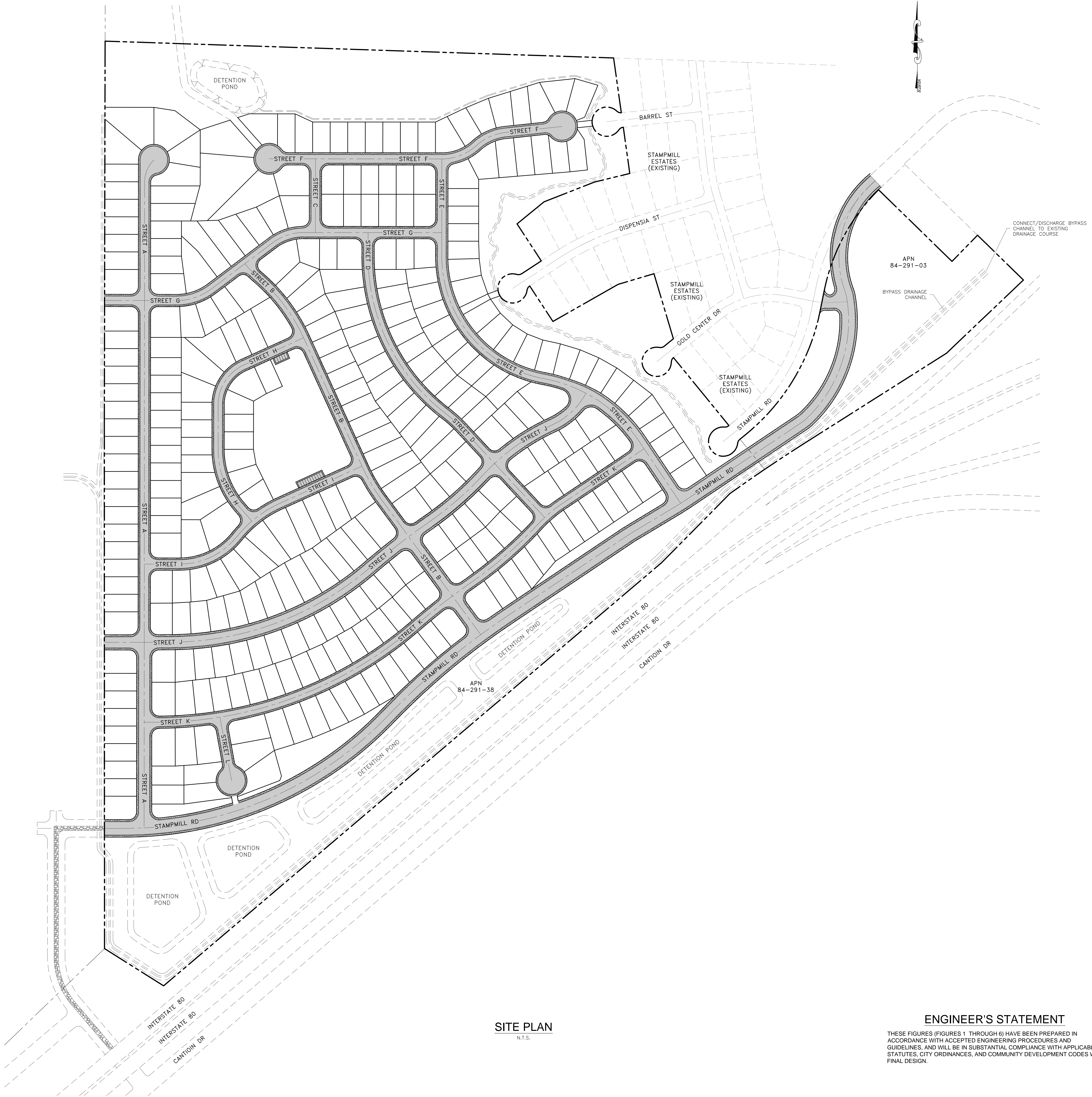
End of Run: 04Feb2017, 00:00

Meteorologic Model: 5 YEAR ST

Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-2	0.0700690	51.5	02Feb2017, 11:55	0.90
Subbasin-3	0.0573381	42.8	02Feb2017, 11:55	0.90
Subbasin-1	0.0209321	15.6	02Feb2017, 11:55	0.90
End	0.14834	110.0	02Feb2017, 11:55	0.90

FEATHER RIVER SUBDIVISION TENTATIVE MAP



SITE PLAN
N.T.S.

OWNER/APPLICANT

AGUA FRIA INSURANCE SERVICES, LLC
3509 E. HARMON AVENUE
LAS VEGAS, NV 89121

ENGINEER

TEC CIVIL ENGINEERING CONSULTANTS
9437 DOUBLE DIAMOND PARKWAY, SUITE 17
RENO, NEVADA 89521

BASIS OF BEARINGS:

NEVADA STATE PLANE COORDINATE SYSTEM
WEST ZONE, NAD(83/94)

BASIS OF ELEVATION:

NAVD88.

SHEET INDEX

- 1 COVER SHEET
- 2 PRELIMINARY SITE PLAN
- 3 PRELIMINARY SITE PLAN
- 4 PRELIMINARY GRADING & UTILITY PLAN
- 5 PRELIMINARY GRADING & UTILITY PLAN
- 6 PRELIMINARY CROSS SECTIONS
- 7 PRELIMINARY LANDSCAPE PLAN

PROJECT DATA

TOTAL NUMBER OF LOTS	325
LOT AREA	57.60 ACRES
RIGHT-OF-WAY	20.64 ACRES
COMMON AREA	38.35 ACRES
TOTAL SITE AREA	116.59 ACRES
SMALLEST LOT SIZE	6,000 S.F.
LOT SIZE	25,740 S.F.
AVERAGE LOT SIZE	7,720 S.F.

UTILITY DATA

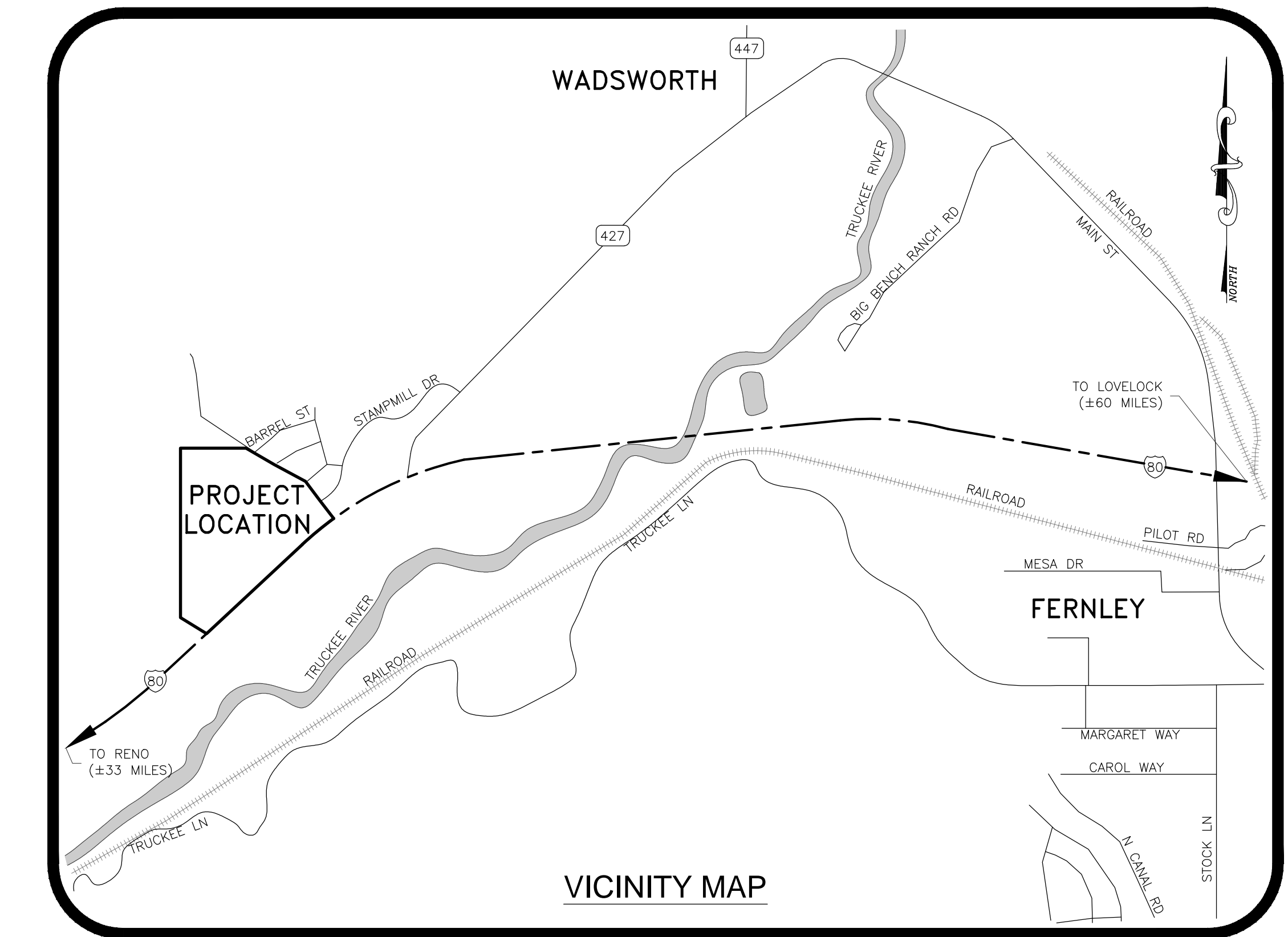
CABLE	CHARTER COMMUNICATIONS
ELECTRIC	NV ENERGY
GAS	NV ENERGY
SANITARY SEWER	WASHOE COUNTY WASTEWATER PLANT
SOLID WASTE	WASTE MANAGEMENT
TELEPHONE	AT&T
WATER	TRUCKEE MEADOWS WATER AUTHORITY

PARCEL INFORMATION

APN:	084-291-38.....	108.41 ACRES
APN:	084-332-03.....	8.18 ACRES

ENGINEER'S STATEMENT

THESE FIGURES (FIGURES 1 THROUGH 6) HAVE BEEN PREPARED IN ACCORDANCE WITH ACCEPTED ENGINEERING PROCEDURES AND GUIDELINES, AND WILL BE IN SUBSTANTIAL COMPLIANCE WITH APPLICABLE STATUTES, CITY ORDINANCES, AND COMMUNITY DEVELOPMENT CODES WITH FINAL DESIGN.



VICINITY MAP

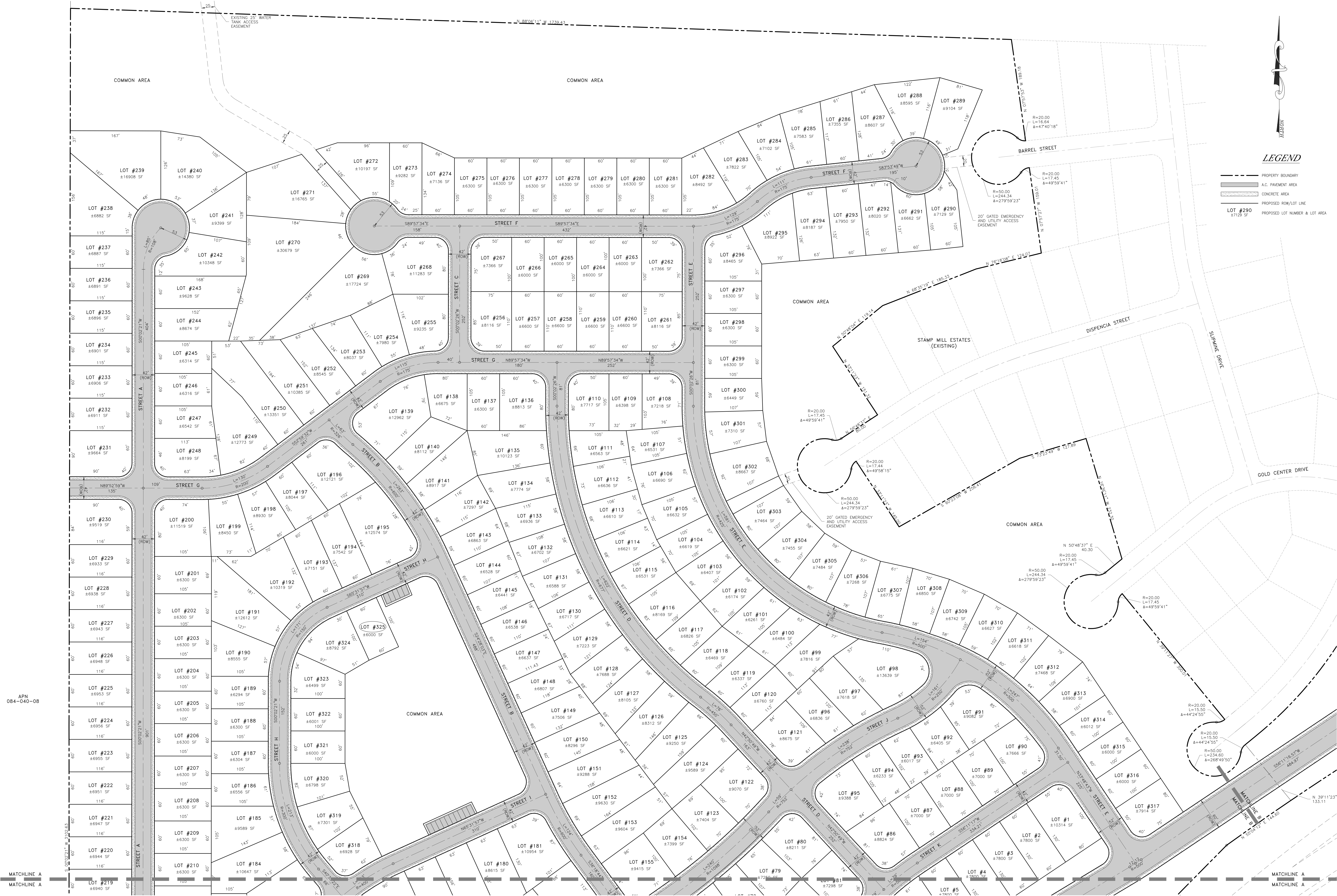


FEATHER RIVER SUBDIVISION TENTATIVE MAP

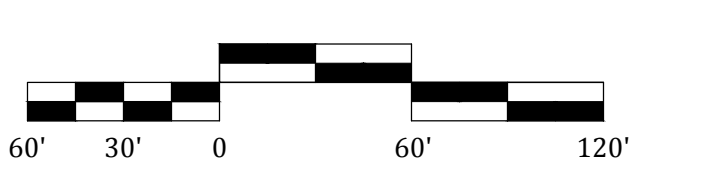


LEGEND

- PROPERTY BOUNDARY
- A.C. PAYMENT AREA
- CONCRETE AREA
- PROPOSED ROW/LOT LINE
- LOT #290 ±7129 SF PROPOSED LOT NUMBER & LOT AREA



APN 084-040-08

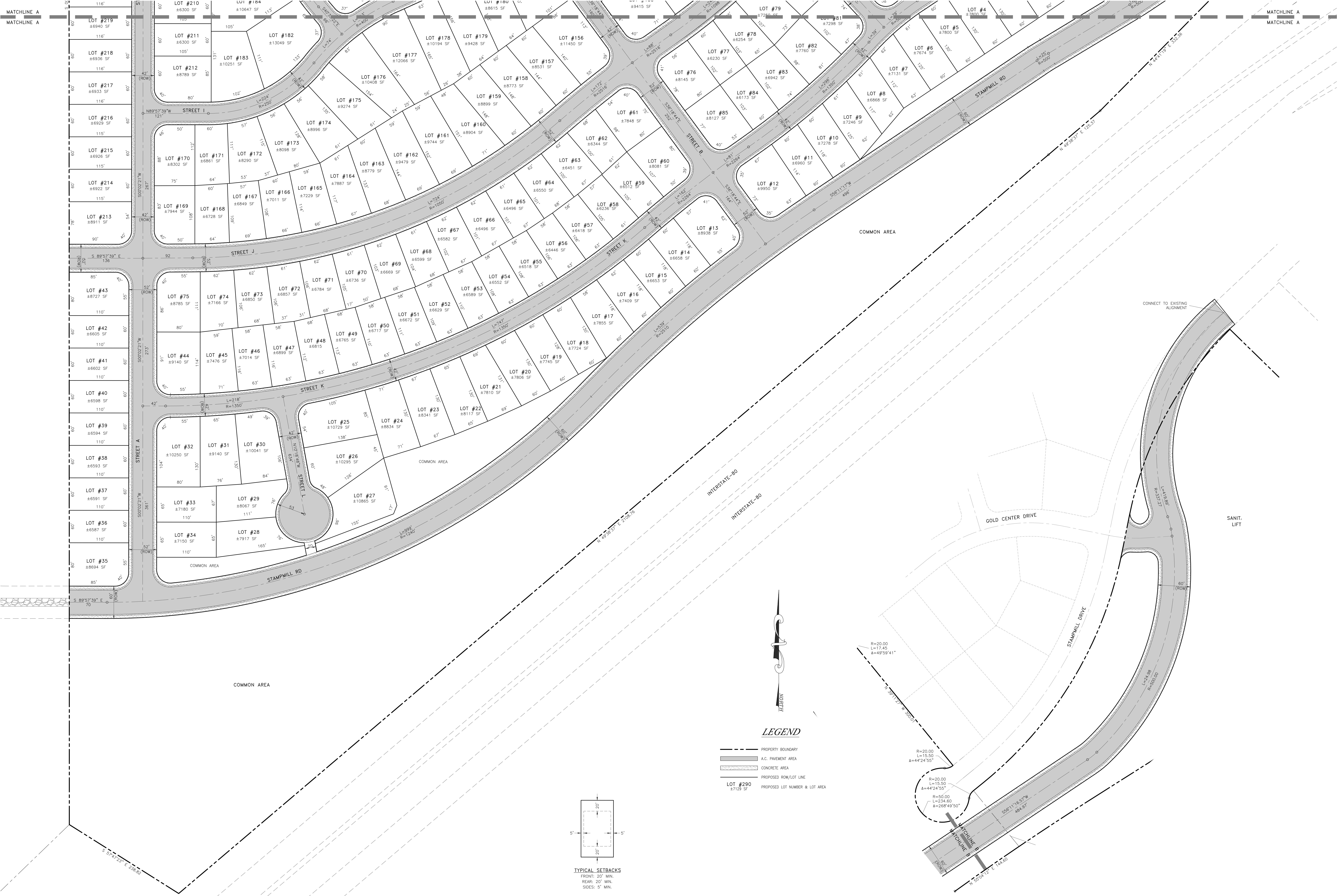


TENTATIVE MAP
COVER SHEET
SHEET 2 of 7

DATE: 2/15/2017
SCALE: 1"=60'
JOB #: AGUAFRIA.01



FEATHER RIVER SUBDIVISION TENTATIVE MAP

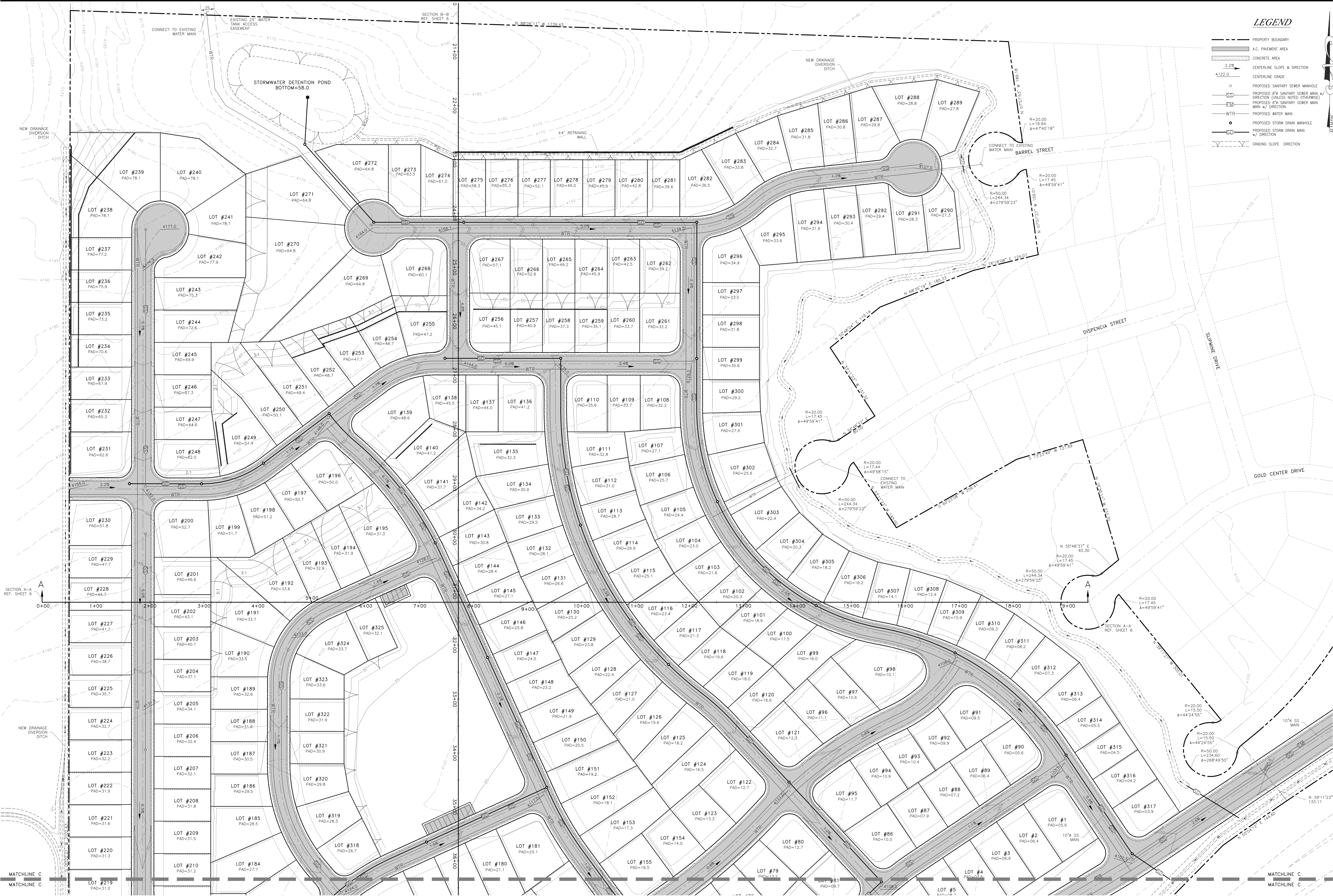


TENTATIVE MAP
PRELIMINARY SITE PLAN
SHEET 3 of 7

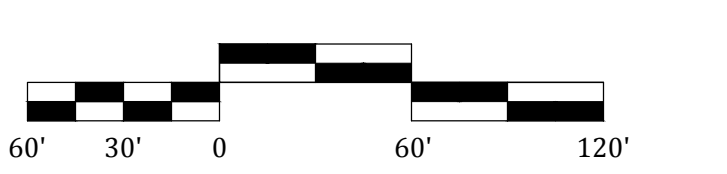
FEATHER RIVER SUBDIVISION TENTATIVE MAP

LEGEND

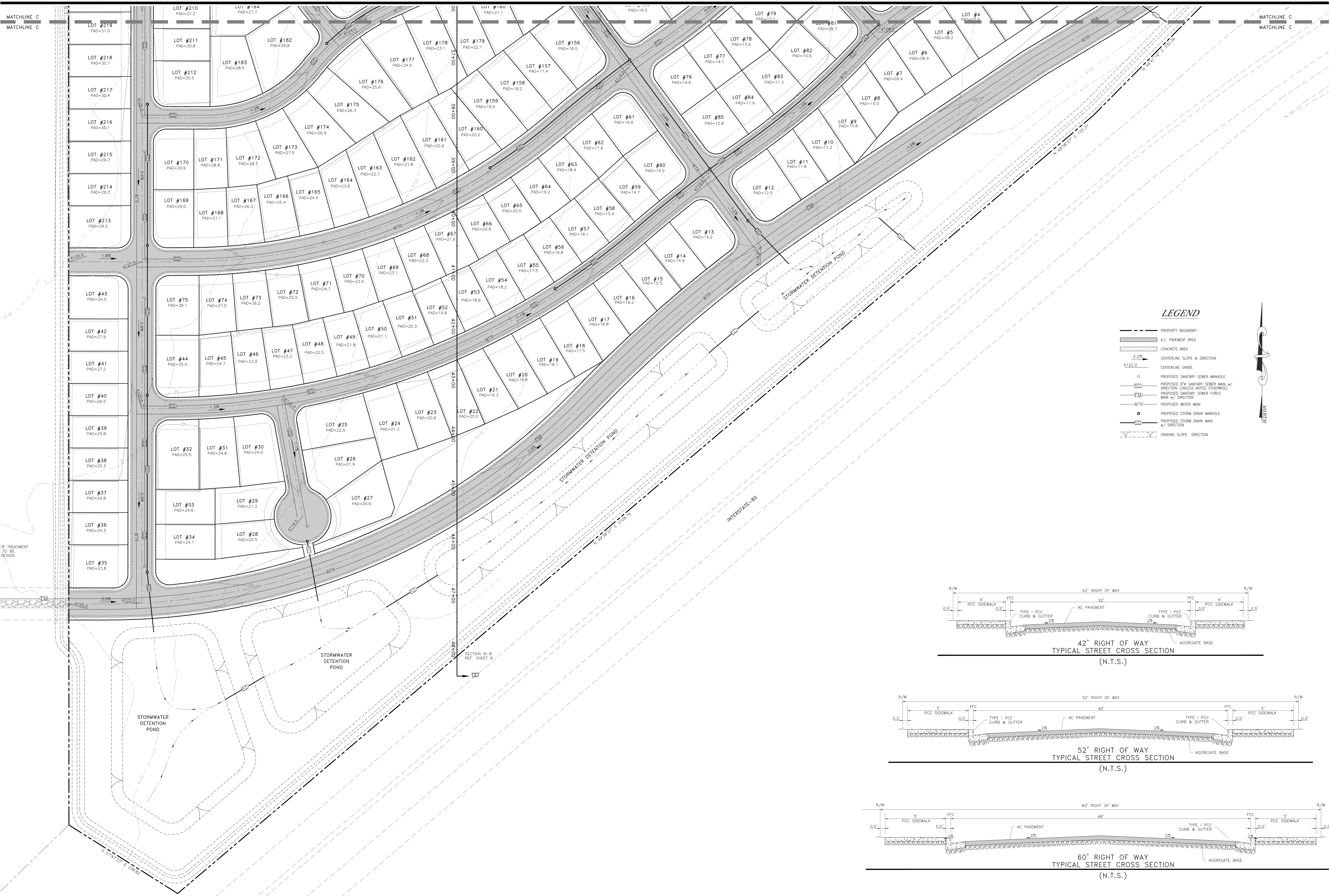
- PROPERTY BOUNDARY
- A.C. PAVEMENT AREA
- CONCRETE AREA
- CENTERLINE GRADE & DIRECTION
- CENTERLINE SLOPE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED 8" SANITARY SEWER MAIN w/ DIRECTION (UNLESS NOTED OTHERWISE)
- PROPOSED 8" SANITARY SEWER MAIN w/ DIRECTION
- PROPOSED WATER MAIN
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN MAIN w/ DIRECTION
- GRADING SLOPE DIRECTION



TENTATIVE MAP
PRELIMINARY GRADING & UTILITY PLAN
SHEET 4 of 7

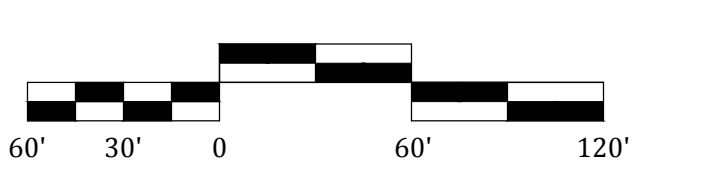
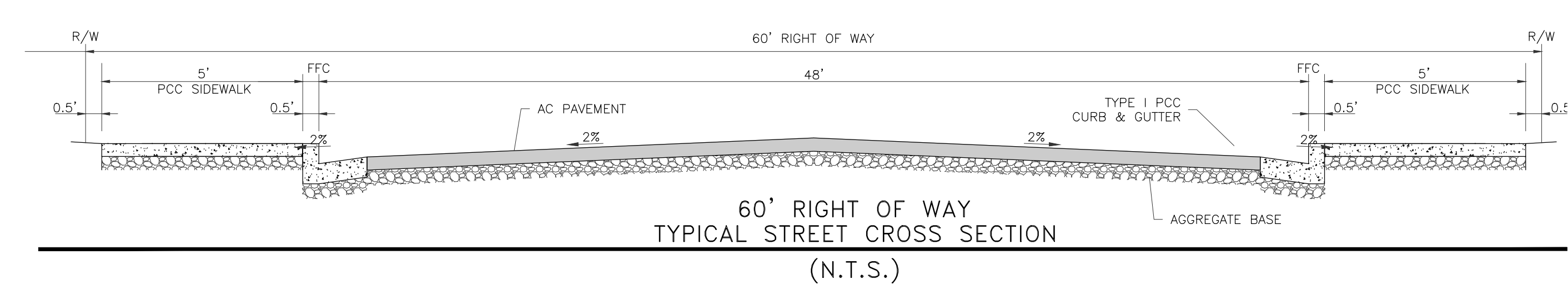
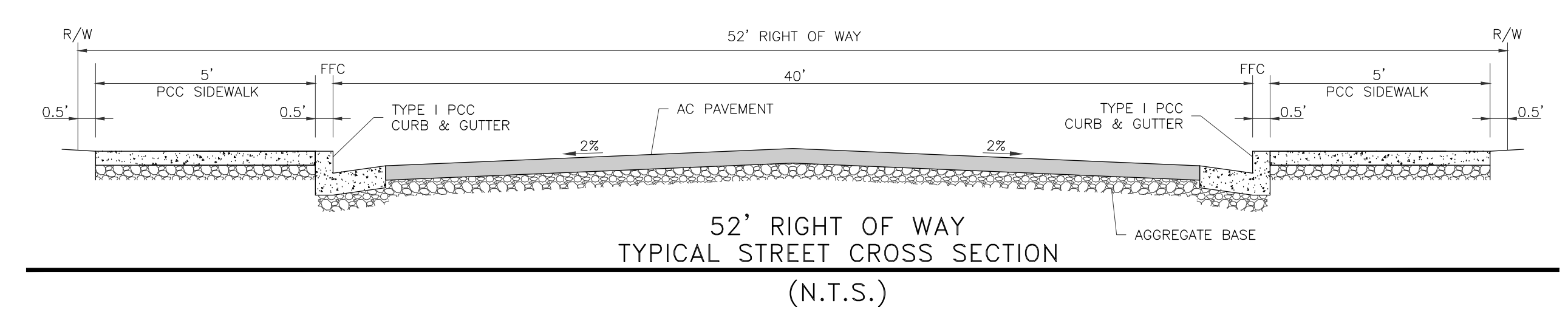
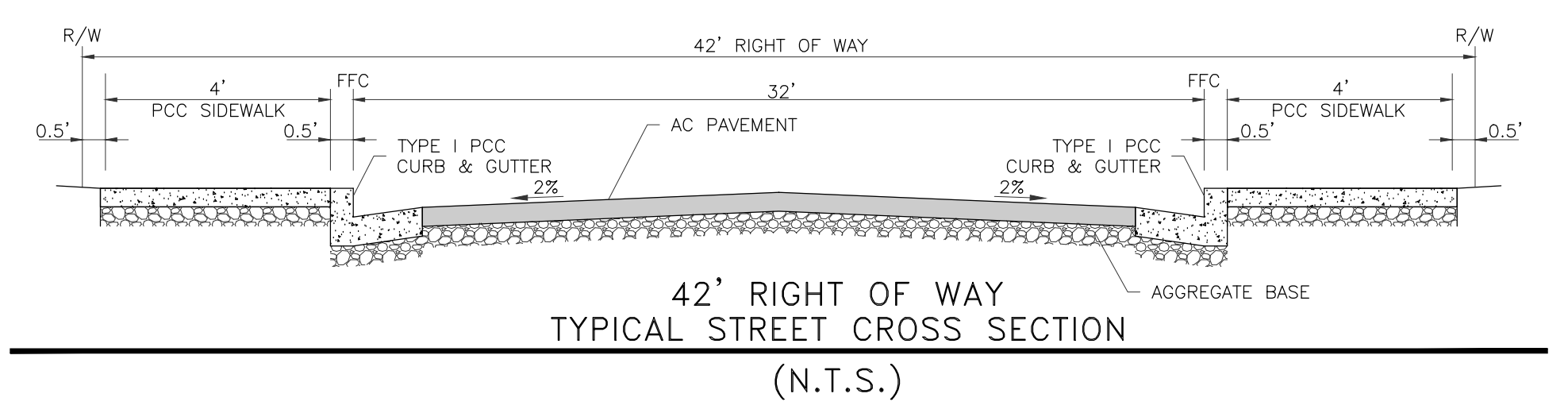


FEATHER RIVER SUBDIVISION TENTATIVE MAP

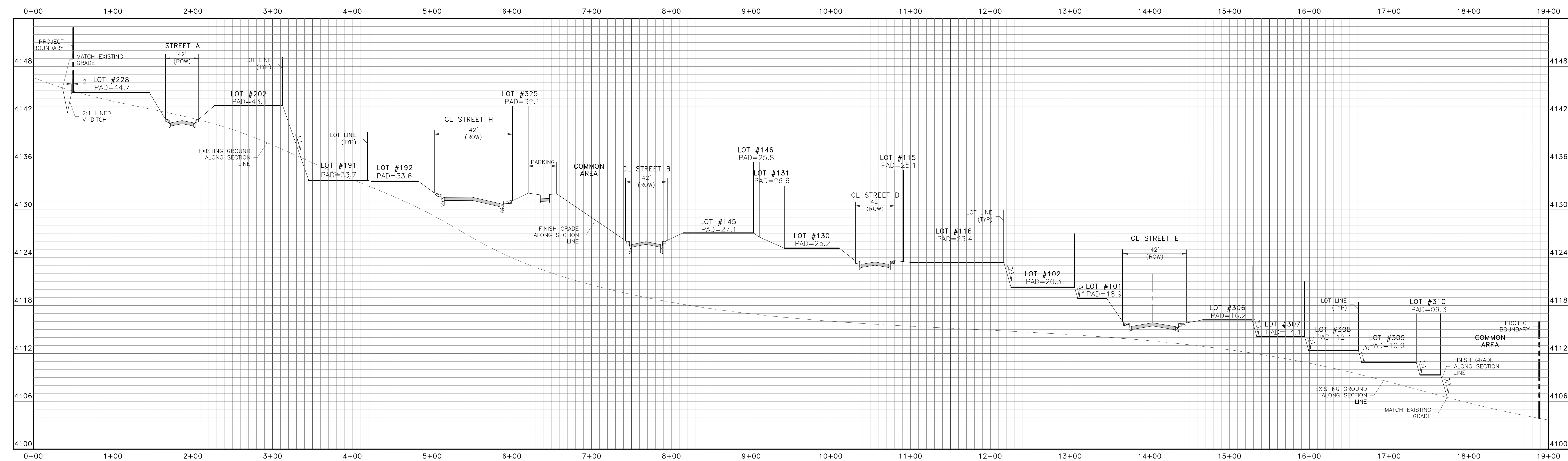


LEGEND

- PROPERTY BOUNDARY
- A.C. PAVEMENT AREA
- CONCRETE AREA
- 2.2% CENTERLINE SLOPE & DIRECTION
- 4122.0 CENTERLINE GRADE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED 8" SANITARY SEWER MAIN w/ DIRECTION (UNLESS NOTED OTHERWISE)
- PROPOSED SANITARY SEWER FORCE MAIN w/ DIRECTION
- WTR PROPOSED WATER MAIN
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN MAIN w/ DIRECTION
- GRADING SLOPE DIRECTION



FEATHER RIVER SUBDIVISION TENTATIVE MAP



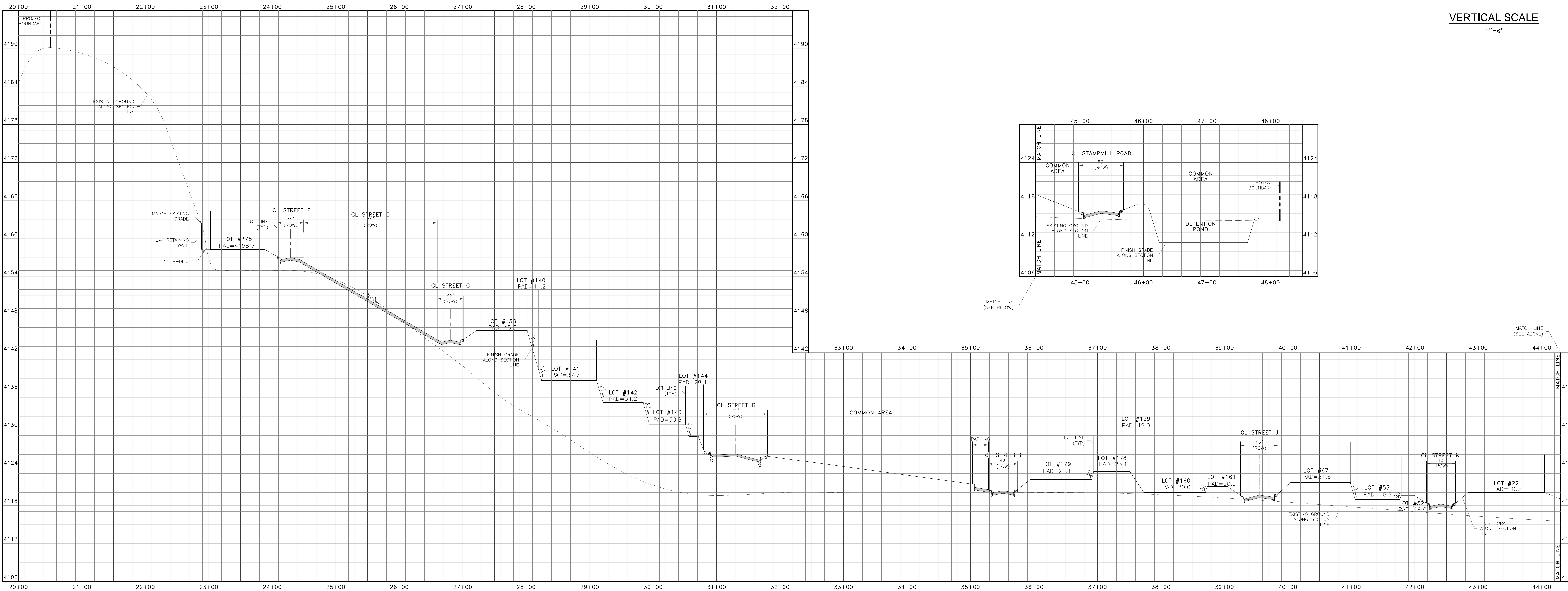
CROSS SECTION A-A

HORIZONTAL SCALE

1"=60'

VERTICAL SCALE







1"=6'



CROSS SECTION B-B

NOTES:
 1) REF. SHEETS 4 & 5 FOR PLAN VIEW AND SECTION ALIGNMENTS.
 2) REF. SHEET 5 FOR TYPICAL STREET SECTION

PLANT LEGEND

-  DECIDUOUS SHADE TREE
-  FLOWERING DECIDUOUS TREE
-  EVERGREEN TREE
-  PLANTING BEDS (SHRUBS AND/OR TURF GRASS)
-  NATIVE UNDISTURBED - COMMON AREA
-  DETENTION BASIN

GENERAL NOTES

- 1) ALL PLANTING AND IRRIGATION SHALL BE INSTALLED PER LOCAL GOVERNING CODES.
- 2) FINAL PLANT SELECTION AND LAYOUT WILL BE BASED ON SOUND HORTICULTURAL PRACTICES RELATING TO MICRO-CLIMATE, SOIL, AND WATER REGIMES. ALL TREES WILL BE STAKED SO AS TO REMAIN UPRIGHT AND PLUMB FOLLOWING INSTALLATION. PLANT SIZE AND QUALITY AT TIME OF PLANTING WILL BE PER CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1).
- 3) ALL PLANTER BEDS WILL RECEIVE 3-INCH DEPTH OF MULCH WITH WEED CONTROL.
- 4) ALL LANDSCAPING WILL BE AUTOMATICALLY IRRIGATED UNLESS NOTED OTHERWISE ON THE PLAN. TURF GRASS WILL BE IRRIGATED USING LOW ANGLE SPRAY, ROTARY, AND/OR IMPACT HEADS TO REDUCE WIND DRIFT. CONTAINER PLANTINGS WILL BE DRIP IRRIGATED. A REDUCED-PRESSURE-TYPE BACKFLOW PREVENTOR WILL BE PROVIDED ON THE IRRIGATION SYSTEM AS REQUIRED PER CODE.

LANDSCAPE DATA

SITE AREA = PARCEL 084-291-38 = 108.41 ACERS
 PARCEL 084-322-03 = 8.18 ACERS

- LOT AREA = 57.60 ACRES
- R.O.W. / COMMON AREA = 51.52 ACRES
- TOTAL SITE AREA = 109.12 ACERS

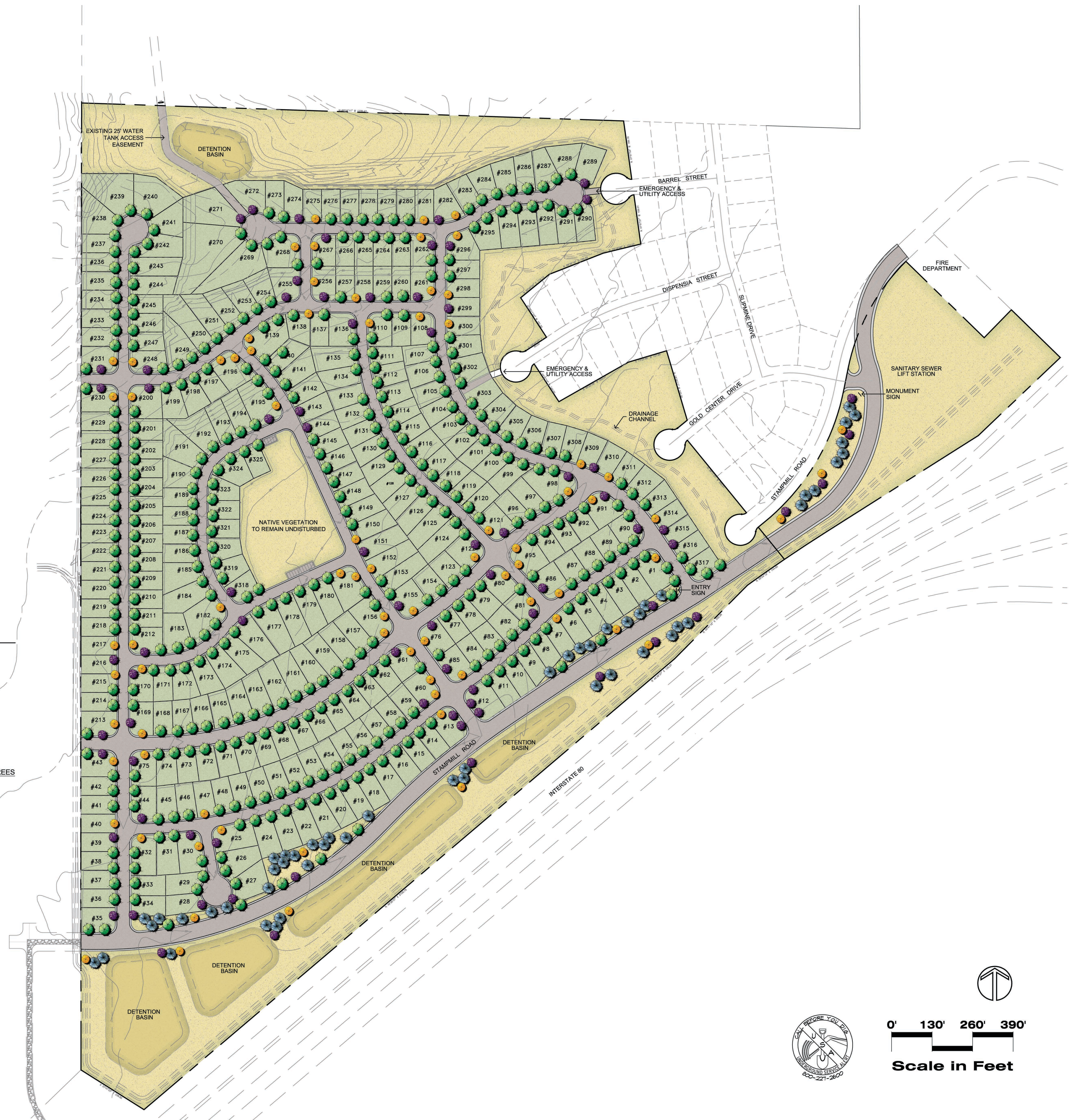
ZONING: MDS - MEDIUM DENSITY SUBURBAN

REQUIRED LANDSCAPE AREA: N/A

TREES REQUIRED = 581

- (1) TREE PER 50 LINEAR FEET OF FRONT YARD ADJOINING A PUBLIC STREET = 529 TREES
- (1) TREE PER FOR EVERY 50 LINEAR FEET OF PERIMETER FRONTAGE ADJOINING AN ARTERIAL OR COLLECTOR = 2,612 LINEAR FEET OR 52 TREES IDENTIFIED ON THE WASHOE COUNTY "COMPREHENSIVE PLAN STREETS AND HIGHWAYS SYSTEM PLAN MAP."

MINIMUM TREES PROVIDED = 581



0' 130' 260' 390'
 Scale in Feet



No.	Revision	Date

HLA No.	202-801-12-16
Designed	SSS
Drawn	SSS
Checked	RWH
CAD File	LI-202-801
Date	2/8/17